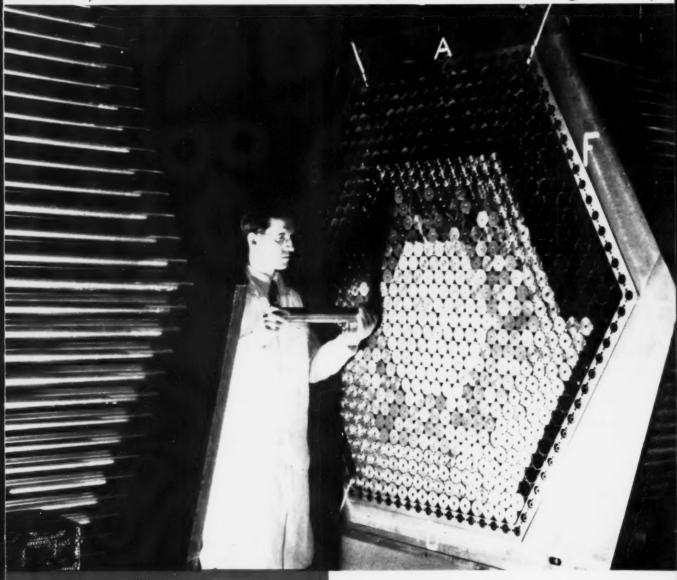
The IRON AGE

March 14, 1957

The National Metalworking Weekly



How to Tap
The Atomic Energy
Market P. 127

The Real Story
On New Plant Spending – P. 87

Progress Report On New Cutting Materials - P.134

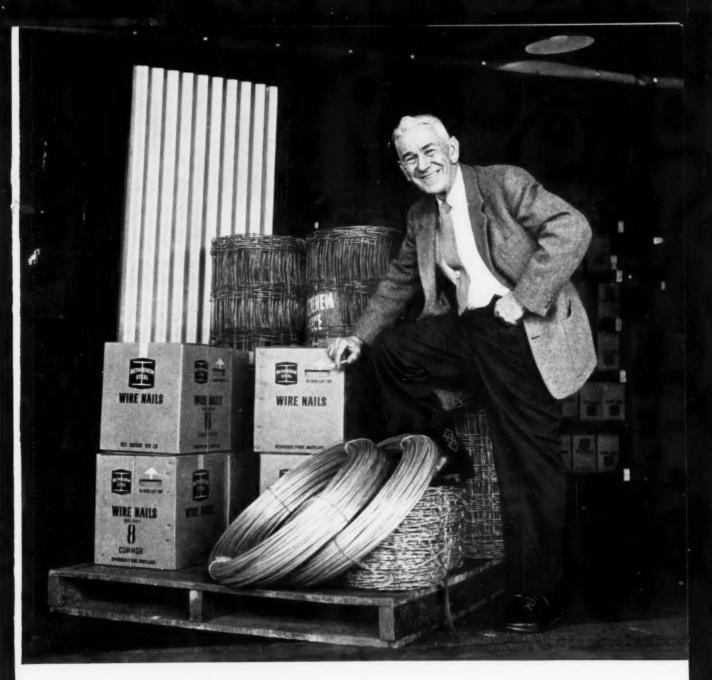
Digest of the Week P.2-3

THE OTHER TURN



The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.





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The IRON AGE

Mar. 14, 1957-Vol. 179, No. 1

Digest of the Week in

*Starred items are digested at right

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NEWS DEVELOPMENTS

Industry Takes a Check On Spending

Changing conditions prompt business to take a second look at its expansion plans. Some immediate easing results, but little long-term change. Record outlay for plants and equipment continues. The rate of spending will hold at about \$37 billion.

P. 87

Building Industry Was Top Steel User in 1956

85

For first time since WWII construction topped automotive as the



largest steel consumer. Shipments to all users last year were 83.2 million tons, a decline of over a million tons from '55.

P. 92

Crane Builders Expect Big Year Despite Steel Shortage

When fast tax aid fell through for steel producers many deferred delivery on new cranes. Despite this and a shortage of plate and structurals, crane builders expect a banner year. Backlogs continue to climb.

P. 95



NUCLEAR STAKES: There are more opportunities opening up in the atomic energy field. Companies not interested in the nuclear end of the business may find atomic energy plants good hardware customers. It is worth a try.

P. 127

Metalworking

Tax Relief for Small Business Has Senate Support

Both parties favor tax cuts and other concessions to small business. But powerful foes and politics rule against relief this year. Better chance seen in 1958, when tax reductions will act as a lever for politicians seeking re-election. **P. 96**

FEATURE ARTICLES

The Atomic Energy Market: How You Can Tap It

How can you share in the estimated \$3-billion atomic power will spend, over the next 10 years alone, for pumps, piping, other "non nuclear" hardware? Other atomic needs: research and development services. AEC access permits are one useful approach for outsiders.

P. 127

Chrome Coating Makes Bench Tools Last Longer

Chrome plating is doubling and tripling life of files, bits, bandsaw blades, other bench tools. The new process puts a 0.000050-in. coating (Rc 70-72 hardness) on files. Users report longer life, freedom from clogging.

P. 132

Cutting Tools Show Great Promise For New Materials

Roundup shows tremendous developments in cutting tools. Titanium carbides $2\frac{1}{2}$ to 3 times faster than tungsten carbide cutters are already on the market. Here's a status report on other tooling materials.

P. 134

Why New-Process Leaded Forgings Machine Faster

Machining tests run on four rings of 1075 grade steel—two leaded by a new process, two unleaded—showed the leaded product machined 31-58 pct faster. Comparisions run on 4140 gear blanks supported findings.

P. 138

Electricity Plays Many Roles In Welding

A complex process starts when you strike a weld arc. Heat, a magnetic field, mechanical c h a n g e s, chemical changes—any or all can occur. Here's an explanation of the forces that cause changes in the arc and affect weld quality.

P. 140

MARKETS & PRICES

Business Is Caught In a Price Squeeze

Inflationary trend continues, but business may find competition will have leveling effect on prices. Easing markets for materials and products will make it more difficult to pass on higher costs. **P. 103**

Framemakers Weigh In For a Fight

The possibility that soon more automakers will be turning to the unitized body instead of the conventional frame, has framemakers worried. Some are developing new tubular frames.

P. 104

Unions Should Start Cleaning Their Own Houses

Senate investigation is expected to point unions in the right direction. Probe will show only worst violations. Unions are expected to take the hint.

P. 109

Machine Tools Sales Off To a Good Start

While soft spots appear in some segments of the economy, machine tool orders are running ahead of last year. Distributors are getting around tight money.

P. 113

Heavy Plate Users See A Glimmer of Hope

Easier demand for sheet and strip is a break for heavy plate users. This is because more light plate is being rolled on sheet-strip mills, freeing plate mills for heavy plate.

P. 185

NEXT WEEK

Get the Most From Your Organic Finishing Dollar

Today's organic finishing materials are engineered to give topnotch durability. But from manufacture to application, they undergo drastic change. Next week's feature tells how to select them





Hammer or Press.....

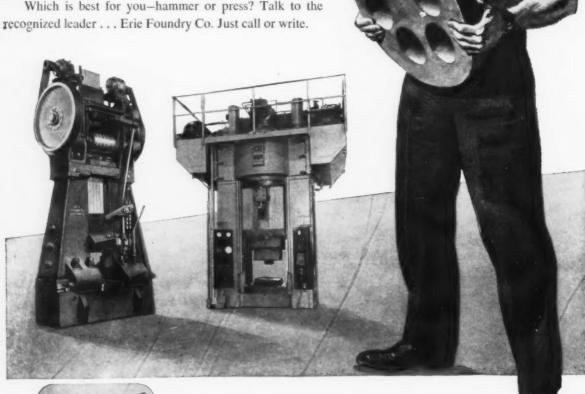


which is best for your forged product?

Hammers forge some pieces more efficiently than presses; presses work some forgings better than hammers. What is a forging man to do? Easy! Talk with the firm that makes the best in both hammers and presses . . . talk with Erie Foundry Company. We will help you with expert specific advice on the right machine for your forging requirements.

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Which is best for you-hammer or press? Talk to the





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Let's Have a Look At the Short-Term View

The gloom is getting pretty thick. The reading on the pessimism chart is lower than the business index. That is hardly warranted.

Most of the forecasts made for this year will come close to hitting the mark. The composite of all predictions indicates that business will be slightly better this year than last.

What's all the crying about then? Some businessmen are jittery over the possibility of a recession. Others are upset because we can't keep going up vertically.

Official industrial statistics still show that business is healthy. Of course, some of these data are 30 to 60 days old when issued. But late business news is not all bad.

The steel rate is expected to level off to 90 pct in the second quarter. Perhaps it will sag a little more than that this summer when everyone goes on vacation. Does that mean the nation's economy is to fall apart? Last July when the steel industry was down tight, the Reserve Board's production index "slid" only 5 points from 141.

Construction will be greater this year. With more steel available, some postponed projects will come to life. Fabricated steel orders are still healthy; some people thought they were falling apart.

Incoming steel orders are not equal to shipments with all steelmakers. But the trend is mixed. Some users think that they will soon get what they want when they want it. That won't be the case. Sometime this year the big inventory-paring phase will end.

New plant and equipment spending will reach \$38 billion this year. Part of that will be higher prices but the physical volume will be equal to or slightly better than last year's experience.

Installment buying was off last year as more people were making paybacks at a faster rate. Savings have soared in the past 12 months. This indicates a lessening in credit inflation.

A lot of people think general business is not good, but theirs is fine. The man on the street isn't on a buying spree but he won't allow the moths to set up housekeeping in his pocketbook.

The economy is getting a slight pause—and correction. It is better to have that now than to have something far worse later.

This is not the time to sell the outlook short. The near-term view is sound. Order-taking is not in vogue but hard selling will smoke out prospects.

Tom Camphee Editor-in-Chief

A Touch here does so much



COOL PROFITS FROM HOT HEADS

A touch of 'dag' 200 on the punch that sinks hexagonal recesses in steel screwheads increases efficiency 40%, doubles production, and improves quality. Two operations and a bulky machine are eliminated, and 42 square feet of floor space gained per machine. Life of the hex punches is extended over 500%.

Before using 'dag' 200, the die in the hammer head seized and pulled out when punched into the white hot blank, resulting in costly rejects and downtime. The unique properties of 'dag' 200, a dispersion of molybdenum disulfide, keep the hammer slamming 2,500 blanks per die—six times more than before. Three hours' downtime is saved per die, and only two-and-a-half gallons of 'dag' 200 are needed to produce 21,000 units.

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LETTERS FROM READERS

Big Hand

Sir—The article "Weld Quality Rides With Steel Selection" by A. C. Ward in your Feb. 21 issue deserves a hand as being one of the most concise and condensed articles I have ever seen covering this subject. V. P. Saxe, Baltimore, Md.

Aloha

Sir—Thank you for sending me tearsheets of articles about Hawaii that have appeared in THE IRON AGE. You have succinctly captured the spirit and significance of the economic facts of life in the islands, and I wish to congratulate you on your successful writing assignment.

It is gratifying to know that so many business executives in the country are having an opportunity to learn about Hawaii through your articles. S. W. King, Gov. of Hawaii, Honolulu, Hawaii.

O. Content

Sir—In the Feb. 7, 1957 issue of THE IRON AGE, on p. 113, the analysis of the exothermic atmosphere gas has been incorrectly reported as follows: 10.6 pct Co₂, 1.1 pct Co, 1.8 pct O₂.

The oxygen content is in error and should read 0.0 pct. It is not possible to have both Co and 0, present in the effluent gas as a result of combustion of a gas-air mixture at these high temperatures.

E. C. Bayer, Metallurgical Engr., Holcroft & Co., Detroit, Mich.

Safety Code

Sir—Thank you for the excellent send off you gave our new Safety Code—"The Use, Care and Protection of Abrasive Wheels" in your Jan. 24 issue. This is truly constructive and deeply appreciated by every member of the Grinding Wheel Institute. A number of our members have written to me commenting most favorably on your handling of this subject. A. T. Dalton, Chairman, Public Relations Committee, Grinding Wheel Institute, Cleveland, Ohio.

Thickness Gage

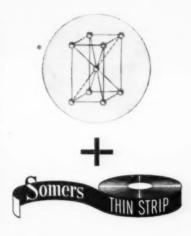
Sir—In a recent issue of your magazine, I noticed an item about a new thickness gage small enough to fit comfortably in the palm of the hand. It utilizes a permanent magnet; makes fast, accurate, non-destructive checks on thickness of non-magnetic materials bonded to smooth iron or steel.

We would greatly appreciate your telling us where we can get more information on this item. L. T. Druck, Purchasing Agent, Warner Gear Div., Borg-Warner Corp., Muncie, Ind.

Write to Instrument Dept., General Electric Co., Lynn, Mass.—Ed.



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i	1/16 STEEL	100,000	UNKNOWN
ľ	3/32 STEEL	75,000	UNKNOWN
Ī	1/8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE **NEVER BEEN RUN TO DESTRUCTION**

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/16 ALUMINUM	125,000	UNKNOWN
3/32 ALUMINUM	100,000	UNKNOWN
1/8 ALUMINUM	75,000	UNKNOWN
5/32 ALUMINUM	50,000	UNKNOWN
3/16 ALUMINUM	40,000	UNKNOWN

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OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

Atomic Energy

Atomic energy is fast becoming a common part of the American industrial scene. One sure sign of this is the 1957 Nuclear Congress being held in Philadelphia this week. It offers businessmen their pick of over 200 technical papers on the subject and a look at new developments in peacetime nuclear applications at the International Atomic Energy Exposition.

Business Prospects—Our editors have been aware of the business possibilities of atomic energy for some time. They also have the feeling that many metalworking companies are missing a bet by not looking into it. If your company is one of them, be sure to read "How To Tap The Atomic Energy Market" on p. 127 this week.

It's not written for or about companies already in the nuclear end of the atomic energy business. But it does show how firms making pumps, bearings, tools, etc., are carving themselves a place in this new market.

Wacky Mottoes

Two years ago C. Randolph Myer and William H. Baudouine of the Abrasives Division of Elgin National Watch Co. felt that American businessmen were tiring of the same, trite "inspirational" mottoes . . . "Keep Smiling," "Do It Now," etc.

As an antidote, they formed their own "Let's Have Better Mottoes Association." Each month they mailed a Motto Of The Month to a select list of customers and prospects. Each slogan poked mildly insulting fun at the stuffed-shirt atmosphere of business.

Good Door-Opener—Has the informal horseplay paid off in good will and sales? "It's the best dooropener we ever had," Myer and Baudouine agree. "Now, when an Elgin salesman visits an office, he's greeted like an old friend. Those wacky mottoes have been paving the way for him."

Below is one of Elgin's recent offerings. We've got lots more on

BE NEAT!

hand. If you like them we'll make it a point to run them regularly. And if you've some pet wacky mottoes of your own, let's hear about them.

Microfilm

We are occasionally asked about the possibility of getting microfilm copies of THE IRON AGE. Some libraries who are considering making their own may not realize that the job has already been done for them.

We have just received the 1956 edition from University Microfilms, 313 N. First St., Ann Arbor, Mich. If you are interested in securing copies the best idea would be to write them directly.

Puzzlers

We all seem to agree that our best chances for survival (the prisoner puzzler, Feb. 7) would see one white ball in one box and the remaining balls in the other box, that is, nine white and ten black. Winners: D. M. Ertner, Western Electric Co., Omaha, C. E. Norton, National Malleable & Steel Castings Co.; and Charlsie, Mr. Letterman, Mr. Berry and Faye, General Steel Castings Corp.

SPEED HEATING SAVE SPACE IMPROVE QUALITY WITH HI-HEAD



R-S HI-HEAD HEATS 25 TONS SLAB PER HOUR...75% LESS FLOOR SPACE... ONE FOURTH LABOR

Now, heating of 25 tons of stainless steel slabs per hour is a continuous operation at Atlas Steels Ltd. The R-S Hi-Head Furnace reaches a high heat fast and maintains it uniformly in all parts of the furnace for the complete cycle. Heating time is reduced . . . there is no overheating of slab edges . . . and uniformity is assured on every piece. Labor is one-fourth that required on conventional furnaces. Floor space used is 75% less.

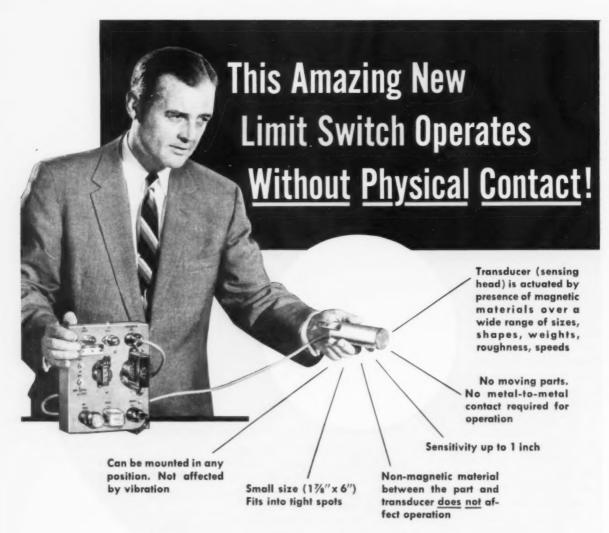
You can boost your "Quality Quota" if you heat with R-S Furnaces. For full technical details on faster slab heating write for the folder "Continuous Slab Heating."

R-S FURNACE CO., INC.

Philadelphia 44, Pa.

Car Hearth Furnaces Continuous Furnaces Rotary Hearth Furnaces





• Here's an entirely new concept in industrial limit switches! We've named it the PROXIMITY LIMIT SWITCH because it is actuated by the nearness of ferrous parts or materials. Since its operation requires no physical contact, it has unlimited applications in places where the use of conventional limit switches is either impractical or impossible! Its range of

application is broadened, too, because the transducer (sensing head) is not affected by vibration or by the presence of non-magnetic material.

In paint spray systems, on production line presses, multiple process machines, heavy automation equipment—there are literally scores of places where this amazing new PROXIMITY SWITCH will do the job better!

ASK YOUR SQUARE D FIELD ENGINEER FOR A DEMONSTRATION. OR WRITE FOR PROXIMITY LIMIT SWITCH BULLETIN. ADDRESS SQUARE D COMPANY, 4041 NORTH RICHARDS STREET, MILWAUKEE 12, WISCONSIN



NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE | COMPANY

EXHIBITS, MEETINGS

Western Metal Show-March 25-29, Los Angeles. (American Society for Metals, 7301 Euclid Avenue, Cleveland 3).

Welding Show-Apr. 8-12, Philadelphia. (American Welding Society, 33 W. 39th St., N. Y.).

Engineered Castings Show - May 6-10, Cincinnati. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.).

Design Engineering Show — May 20-23, New York. (Clapp & Poliak, 341 Madison Ave., N. Y. 17).

Packaging & Handling Show-Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22).

Metal Show-Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3).

MARCH

Steel Founders' Society of America -Annual meeting, March 18-19, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland.

American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.—Regional meeting, March 18-19, Rackham Bldg., Detroit. Society headquarters, 29 W. 39th St., New York.

American Society of Mechanical Engineers-Second national conference of the Gas Turbine Power Div., March 18-21, Sheraton-Cadillac Hotel. Detroit. Society headquarters, 29 W. 39th St., New York.

Continued on P. 16

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CALIFORNIA-Los Angeles Meyer Sheet Metal Machinery VAn Dyke 1477

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Cambridge Austin-Hastings Co., Inc. Kirkland 7-4480

MICHIGAN—Detroit United Saw & Tool Co.—TRinity 2-0246

MINNESOTA—Minneapolis Minnesota Steel Sup. Co.—ATlantic 6273

Greensboro Armentrout Mchry. Co.—Phone: 4-8218

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MASSACHUSETTS-

CHICAGO*

Induction Hardened*

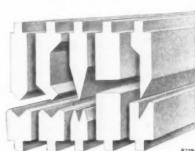
PRESS BRAKE DIES

Dealers Offer

This country-wide organization of in increments of 2 feet.

press brake.

call your nearest dealer listed here. With Bulletin D-455 you can order by number. Ask for copy.



Stock Deliveries

local dealers offers immediate delivery on many CHICAGO induction hardened press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO induction hardened dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard

On your needs for press brake dies,

*Induction hardening is a special, highfrequency process used to harden wear surfaces of CHICAGO dies. Field reports on CHICAGO induction hardened dies show up to ten times longer life than conventional press brake dies.

Milwaukee F. W. Burns Mchry. Co.—FRanklin 4-1540 Production Equip. Co.—GReenfield 6-6075



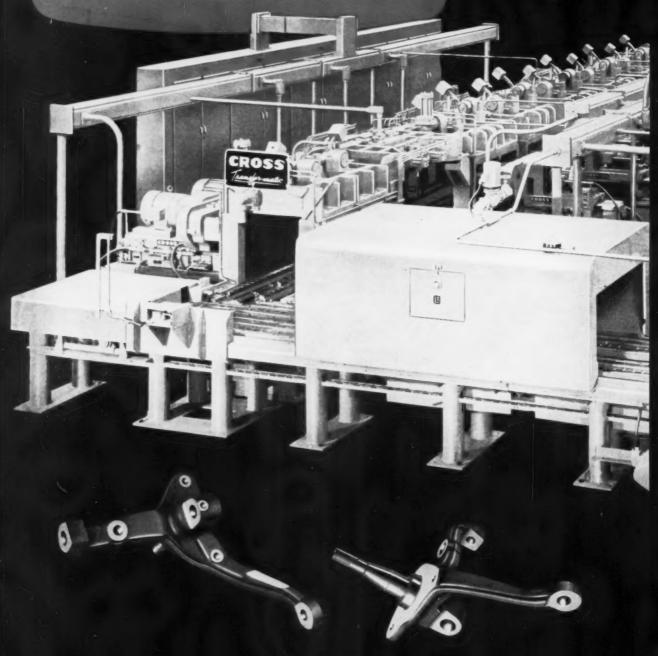
Press Brakes · Straight-Side-Type Presses · Press Brake Dies

Hand and Power Bending Brakes . Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.

7430 South Loomis Boulevard, Chicago 36, Illinois

Mills, Drills, Reams, Threads Integral Front Wheel Spindle and Steering Arm



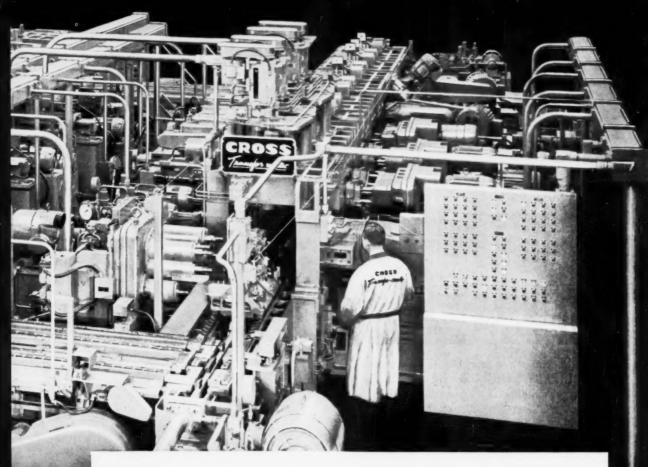
Established 1898

CROSS

First in Automation

PARK GROVE STATION . DETROIT 5, MICHIGAN

Another Transfer-matic by Cross



- * Straddle mills upper and lower support arm bosses; straddle mills steering arm boss; mills steering arm stop pad; mills spindle keyway; drills and taper reams upper and lower support arm holes and steering arm hole; drills, reams, chamfers and spotfaces two brake mounting plate holes; drills, counterbores, spotfaces, chamfers and reams brake anchor hole; drills spindle cotter pin hole; and threads wheel spindle.
- * 144 right and 144 left hand parts per hour at 100% efficiency.
- * Pallet type work holding fixtures locate parts from spindle bearing diameters.
- Power wrench clamps work holding fixtures automatically.

- ★ Gravity operated cam clamps for the work holding fixtures.
- * Automatic transfer mechanism indexes right and left hand parts through all 17 stations in pairs.
- Automatic indexing units turn fixtures 82° at Stations 11 and 17.
- Cross modular unit construction provides flexibility for design changes.
- ★ Other features: construction to JIC standards; hardened and ground ways; hydraulic feed and rapid traverse for milling, drilling and reaming; individual lead screw feed for threading; automatic fixture cleaning unit; complete interchangeability of all standard and special parts for easy maintenance.

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FOR MECHANICAL or ELECTRIC OPERATION



CUSTOM-BUILT and quality-built for dependable service. Easton experience includes all types of furnace and transfer cars for modern heat treating systems. Built to any desired capacity.

Write or telephone for technical information.

OUR 42ND YEAR

FREE MARKAL PAINTSTIK!

We will send you without cost or obligation a MARKAL PAINTSTIK. They are available in various types suitable for marking on any kind of material. Hot surfaces up to 2100°F, cold down to -50°F; acid or alkali conditions; wet, dry, icy, oily, rough, smooth. For welding or heat treating . . many others. Markal Paintstiks are Permanent, Fadeproof, Weatherproof.



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Yes-I want to try marking with a MARKAL PAINTSTIK! Here's what I want to mark:

Temperature Range:

Name Company_

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My Distributor's Name & Address __

MARKAL COMPANY 3088 West Carroll Avenue . Chicago 12, III.

EXHIBITS, MEETINGS

Continued from P. 13

Society of Automotive Engineers-National production meeting and forum, March 20-22, Hotel Statler, Buffalo, N. Y. Society headquarters, 29 W. 39th St., New York.

American Society of Tool Engineers - Silver anniversary annual meeting, March 23-28, Shamrock Hilton Hotel, Houston, Texas. Society headquarters, 1007 Puritan Ave., Detroit.

Instrument Society of America-Pittsburgh section, annual conference on instrumentation for the iron and steel industry, March 26-27. Hotel Roosevelt, Pittsburgh. Society headquarters, 845 Ridge Ave., Pittsburgh.

ASME-AIEE - Fifth annual engineering management conference, March 27-28, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 29 W. 39th St., New York.

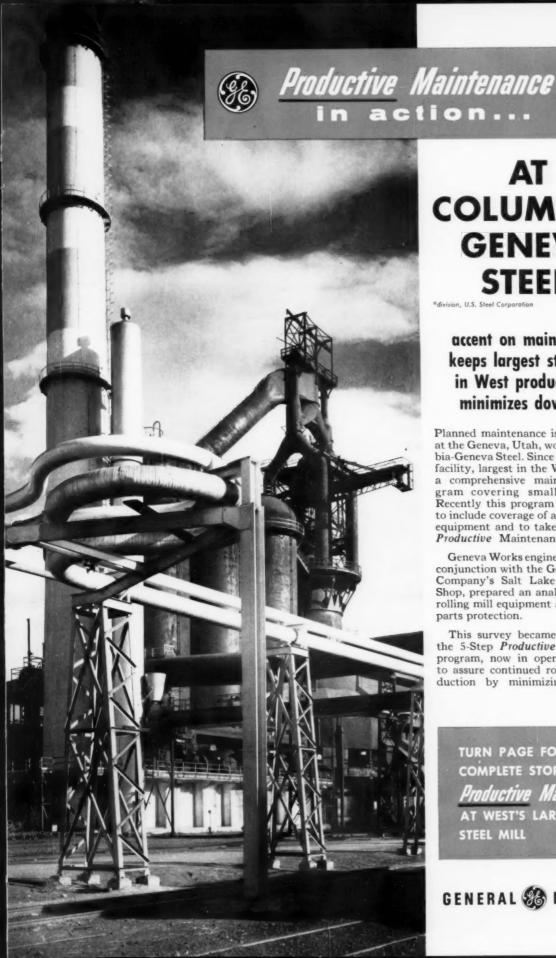
APRIL

American Hot Dip Galvanizers Assn.—Annual meeting, Apr. 2-3, The Empress Hotel, Miami Beach, Fla. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

National Screw Machine Products Assn. — Annual spring meeting, Apr. 7-11, Shoreham Hotel, Washington, D. C. Society headquarters, 2860 E. 130th St., Cleveland.

Malleable Founders' Society-Market development conference, Apr. 10-11, Edgewater Beach Hotel, Chicago. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society of Mechanical Engineers-Spring meeting, Apr. 8-10, Dinkler-Tutwiler, Birmingham, Ala. Society headquarters, 29 W. 39th St., New York.



AT COLUMBIA-**GENEVA** STEEL*

accent on maintenance keeps largest steel mill in West productive minimizes downtime

Planned maintenance is nothing new at the Geneva, Utah, works of Columbia-Geneva Steel. Since 1944 this steel facility, largest in the West, has used a comprehensive maintenance program covering small equipment. Recently this program was extended to include coverage of all large critical equipment and to take advantage of Productive Maintenance protection.

Geneva Works engineers working in conjunction with the General Electric Company's Salt Lake City Service Shop, prepared an analysis of critical rolling mill equipment and associated parts protection.

This survey became the basis for the 5-Step *Productive* Maintenance program, now in operation, helping to assure continued rolling mill production by minimizing downtime.

> TURN PAGE FOR COMPLETE STORY OF Productive Maintenance AT WEST'S LARGEST STEEL MILL

GENERAL & ELECTRIC



How Columbiacontinuity



COMPLETE NAMEPLATE
DATA GATHERED

Geneva Works began its *Productive* Maintenance plan by making a complete equipment inventory, and establishing a record system which is now a basic part of their program. Well edited record cards include a description of all electrical equipment such as this large slabbing mill drive motor at left: rating, application, serial number, manufacturer, purchase order number, inventory number, and cost information.



2 EVALUATION FOR ROUTINE MAINTENANCE MADE

The Geneva Works soon discovered some equipment could be excluded from the plan. Only items included were those on which a *Productive* Maintenance program would pay, like this important D-C circuit breaker. In some cases it was found to be cheaper to repair or replace the entire piece of equipment after it broke down, rather than use high-cost manpower to inspect and maintain it.



ROUTINE OPERATING CONTROL SYSTEM ESTABLISHED

A work order program was established and renewal parts recommendations secured. Utilizing data gathered in the first two steps, this Columbia-Geneva maintenance specialist and foreman strike an inspection balance between "too often" and "not often enough." Estimated turnover rate for each part, procurement time, and cost determine minimum stock level. Parts are purchased from original supplier when reorder signal indicates need.

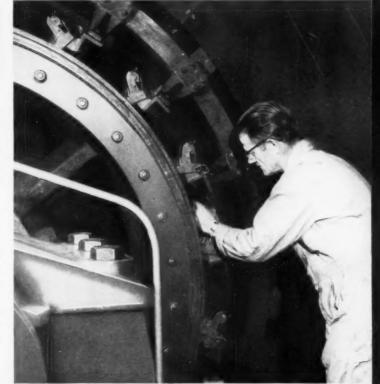
Geneva Steel protects production with *Productive Maintenance*

STE

EVALUATION FOR CRITICAL MAINTENANCE MADE

Geneva Works has adapted its *Productive* Maintenance program to take full advantage of this step, considered by many to be the most worthwhile step in terms of dollars and cents saved. Equipment is considered critical if its failure could directly or indirectly interrupt or delay production. The 5000-hp strip mill motor, at the right, is an example.

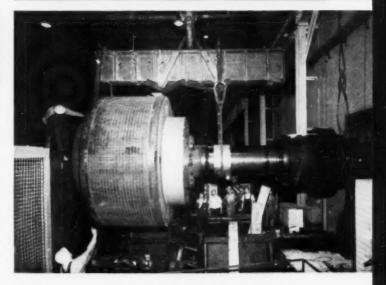
How much protection is needed for each piece of key equipment is determined by the following procedure: calculate repair time needed for a major failure if no critical parts are stocked, if some are stocked, if all critical parts are stocked, or if complete unit is stocked. Next, determine the cost of repair and inventory for each possible condition. Total this information to determine "failure cost." Analyze total cost for each condition to determine what you should stock for "best" protection.



STEP

CRITICAL MAINTENANCE PROGRAM ESTABLISHED

This step minimized downtime costs by stocking of critical parts and by planning overhauls far ahead. It paid off at Geneva Works recently with the installation of this spare 3500-rpm armature in a 7000-hp reversing-rougher mill motor during a scheduled downtime. This removal of equipment for overhaul at times most favorable to production narrows the gap between actual and theoretical maximum output. Columbia-Geneva now has a 5-year *Productive* Maintenance program under way which will plan all maintenance by steel production operation rather than by machine. This will result in greater savings to Columbia-Geneva.



Turn page and see how you can profit from Geneva Works' example



YOUR ANALYSIS of key equipment protection, with the cooperation of your nearest General Electric Service Shop, makes *Productive* Maintenance pay off—as it did at Columbia-Geneva.

To reduce equipment breakdowns, and maintain high production continuity in your plant . . .

General Electric will help set up your *Productive Maintenance* program

Call in G.E. for help in starting your *Productive* Maintenance program. Your nearest G-E Apparatus Service Shop or Sales Office will work with you in setting up a program for your plant. General Electric can help you in five ways:

Complete data on parts: Ask your G-E Maintenance Specialist to supply you with proper identification of all renewal parts for each piece of your electric equipment. This will complete your basic records.

Routine inspection plans: By looking over your system, he can help you organize your inspection trips, estimate attention needed by equipment, offer upkeep guidance.

Renewal parts inventory: He can help tailor a renewal parts plan specifically designed for your plant's needs, guide you in establishing a system of parts inventory.

Critical analysis for best protection: Your G-E specialist can tell you just how long repairs will take for critical equipment, give you an estimate of repair costs. Determining "best" protection will be greatly simplified.

Assessment of critical equipment: He can help you estimate condition of key equipment, schedule men and machines at the nearest G-E Service Shop to help you during planned overhauls.

(General Electric Company
1	Apparatus Sales Division, Section BB801-20
5	schenectady 5, New York
	Please send me the detailed manual (GEA-6087) o

ting up a Productive Maintenance Program in my plant.

□ Please have a Maintenance Specialist call on me.

 $\hfill \square$ I would like to schedule a showing of G.E.'s film "Productive Maintenance."

Name	

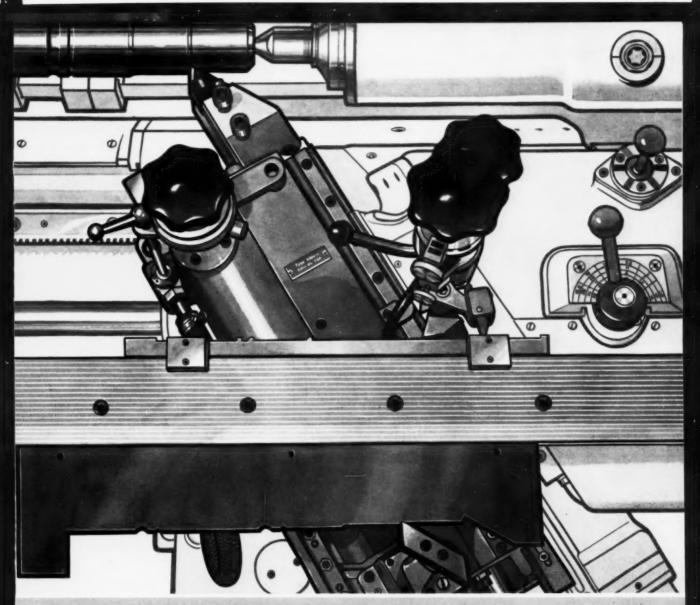
Position

Company

City____State___

Productive Maintenance —as vital as production itself!

GENERAL 🛞 ELECTRIC



New Britain +GF+ outproduces

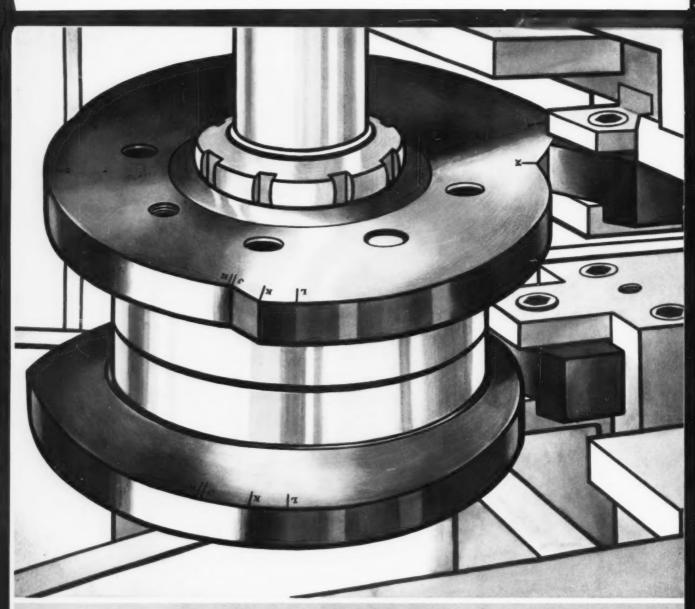
multi-tool lathes with a single tool

How can one tool outproduce several? The answer is — maintain dimensional relationships with a template or prototype instead of a multi-tool setup. This cuts tool changeover time to practically zero.

On the New Britain +GF+ copying lathe, you can cut at maximum speeds and feeds for tool efficiency without worrying about tool wear and the delicate readjustment of several cutting tools. When the tool wears, change it, bring one dimension to size. The other dimensions have to be right. Your choice of a New Britain +GF+ means elimination of any extra operation to bring pieces within grinding tolerances.

Machines from New Britain's three machine tool divisions incorporate the *basic principles* of more profitable production.





cams put the precision

in precision boring

When you are working to "tenths" cams are your best method of maintaining accuracy, because cam control of the tool is *positive* control. The accuracy of parts produced on New Britain boring machines *can't* be affected by variable hydraulic pressures, ambient temperature, or play in complicated linkages.

In boring machines or *any* machine tool investment, be sure your most important requirements are met, not by gadgets, but by the fundamental design principles employed. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.



Switch to this new General Electric

WHITE MERCURY LAN



70U can use the new General Electric White Mercury Reflector Lamps in your present 400-watt mercury equipment with no change or added investment in operating equipment.

1 GET UP TO 63% MORE LIGHT ON WORK FROM YOUR PRESENT FIXTURES: Because a brand new phosphor generates more white light than ever before you get from 7% to 63% more light on the work, depending upon the lamp type you are replacing. (See below).

2 GET UP TO 33% LOWER COST OF LIGHT IN YOUR EXISTING INSTALLATIONS: With this increased efficiency your unit cost of light can go down from 7% to 33%. (See below)!

3 GET LOWER INITIAL COST FOR NEW INSTALLATIONS: You can get *more* light from the same number of fixtures, or get equal light with up to 1/3 fewer fixtures!

You get all this with new General Electric White Mercury Reflector Lamps because of a specially designed strontium magnesium orthophosphate phosphor. This phosphor converts ultra-violet radiation into more white light than ever possible before. It's also an efficient reflector-sealed in against dirt and fumes.

Gain these advantages now. Replace your present mercury lamps with the new G-E H400 RW-1. Also available in the bulged tubular shape, the H400 EW-1. For more information write: General Electric Large Lamp Dept. IA-3, Nela Park, Cleveland 12, Ohio.

> ADVANTAGES OF NEW G-E WHITE MERCURY OVER OTHER G-E

400-WATT MERCURY LAMPS NEW RW-1 vs E-1 (clear glass) NEW RW-1 vs A-1 (clear glass) • 28% to 31% more

• 55% to 63% more light to the work

- 27% to 33% lower cost of light
- Less maintenance
- · Whiter "Color"

- light to the work
- cost of light
- in upward light

NEW RW-1 vs J1

- 37% to 40% more
- 24% to 30% lower
- Less colorimprove

- 16% to 23% lower
- Less maintenance Well suited for use
- fixtures · Whiter "Color

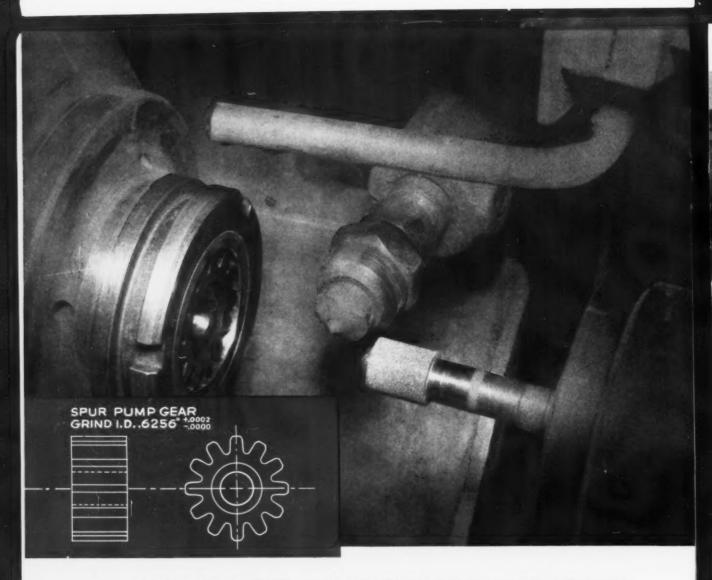
NEW RW-1 vs RC1 and R1 (reflector shape)

- About 7% more light on the work
- 7% lower cost of light
- Less color im-provement for RC-1 users



GENERAL (26) ELECTRIC





A GRINDING PROGRESS REPORT

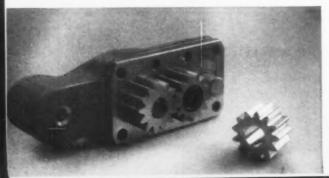
Extra Fine Grit Silicon Carbide Succeeds in Tough Vasco Supreme I. D. Grinding Job.

One basic fact affects wheel selection for all internal grinding: Only light infeed pressure is possible. With the wheel mounted at the end of a long, slender spindle, too much pressure would cause deflection and distort the hole. The relatively large area of grinding contact further reduces the infeed pressure. Also,

small wheels and high spindle speeds mean limited driving power.

On extremely hard, tough metals, the problem of finding the wheel to grind efficiently becomes critical. For harder metals it is usual to use softer grinding wheels, but there is a limit. It comes when the wheel is so soft it will not hold shape, requires frequent dressing for re-truing, and wears out quickly.

W. H. Nichols Co., Waltham, Mass., faced a challenging problem in production grinding the I.D. of spur pump gears made of Vasco Supreme, Neatro, or Ohio Air Die steels hardened to 58 - 64 Rockwell C.



Gear pumps made for the synthetic yarns industry by W. H. Nichols Co., require hard, abrasion-resistant steels.



W. H. Nichols Co. Foremen Rousseau and Burns, and Abrasive Engineer Pete Wilson checked closely on production, quality, and wheel performance with operator, during trials.

There, Bay State Distributor Engineer Pete Wilson worked closely with "Skipper" Burns, Production Foreman, and Hector Rousseau, Grinding Foreman. First, they reasoned that for these materials of high carbide content, Silicon Carbide abrasive would penetrate better and give cleaner cutting than the Aluminum Oxide being used.

They also reasoned that more cutting action would occur if more and smaller abrasive grains were cutting into this hard material. Instead of the normal grit sizes of 80 - 90, they tried grits ranging from 150 to 240.

How right they were is proved daily, in W. H. Nichols' production figures and grinding costs. Using 240 grit Silicon Carbide on the Vasco Supreme, and 150 grit on the Neatro and Ohio Air Die steels, their grinding wheels now have three times the old life. Dressing, which formerly removed .008" of the wheel each cycle, now takes only .001", just enough to keep the wheel sharp. With the extra fine grit sizes, the wheels grind more efficiently and hold shape excellently. Production schedules are being met with gears of fine dimensional accuracy, 50 or more being completed per wheel.

Top ranking abrasive engineering skills like those used in this case are available to you for your grinding. Contact your local Bay State distributor, any branch office, or the Bay State Abrasive Products Co., Westboro, Massachusetts.

Improved finish (5 micro-inch) from the finer grits also gives greater accuracy in the air-gaging.

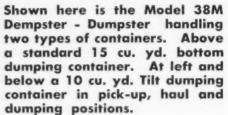


Branch Offices are located in Bristol, Conn.; Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; Pittsburgh, Pa.; with distributors in all principal cities.

In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ont.









Payloads Lifted, Hauled and Dumped by One Man and the DEMPSTER-DUMPSTER

TO ELIMINATE WASTE in time, labor and the expense of double-handling heavy salvable materials, this Dempster-Dumpster, installed in one of the nation's leading industrial plants, lifts, hauls and discharges 18-ton payloads with only one man, the driver.

Such heavy load requirements, of course, are the exception. But the important factor in the tremendous savings of the Dempster-Dumpster System is not capacity. It is the ability of only one truck-mounted Dempster-Dumpster, constantly on the move, serving many containers of various types and sizes, standard or special, built to meet the requirements of any plant.

Our records of hundreds of installations in plants of almost every known classification, show savings of from 60 to 90 per cent over previous methods. Moving materials from one point to another swiftly, economically, is a problem in every industrial plant in the nation. Most of these plants need the Dempster-Dumpster System.

Whether it's liquids, acids, rubbish, salvable, raw, finished, light, heavy or high temperature materials, there's a Dempster-Dumpster and containers, of 2 to 21 cu. yds. capacity, built to handle it. And all with only one man, the driver.

Can the Dempster-Dumpster System be used profitably in your plant? Let one of our engineers discuss it with you. Dempster Brothers, Inc. . . . serving all industry throughout the nation.



DEMPSTER BROTHERS, 437 N. Knox, Knoxville 17, Tennessee

6168

Simple Arithmetic... Type 302, Sheet Base Price 5000 cents per lb. Type 430, Sheet Base Price 30, Sheet Base Pri

Now you can SAVE \$215 per ton in base price alone!

Many designers and fabricators who are currently using Type 302 stainless can, in numerous applications, specify Type 430 straight chromium stainless and take advantage of the 1034 cents per pound difference in base price. Some of our customers are already saving more than \$215 per ton using our 430 MicroRold stainless sheet.

The steel industry estimates that 50% of all stainless sheet applications could satisfactorily employ Type 430, the least

expensive of all stainless grades, as an economical and practical material. When properly applied, Type 430 has all the desirable qualities of beauty, corrosion resistance, strength, long life and low maintenance that no other material, except stainless, can offer.

We are currently producing our MicroRold Type 430 sheets up to 48" wide in thicknesses .005" to .109" with 2B or 2D finishes; and in thicknesses .010" to .109" in No. 3,4 and 7 finishes.

Send for Your copy, "Care and Use of 430 MicroRold Stainless Steel"

Washington Steel Corporation
3-L WOODLAND AVENUE, WASHINGTON, PA.



Helpful Data from DE LAVAL

How to calculate the efficiency of worm gearing

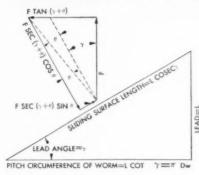
The efficiency of worm gearing is determined by frictional losses at the tooth contact, bearings and oil seals plus losses from oil churning and windage. A formula for efficiency at the tooth contact may be developed from a consideration of the forces at the contact. Figure 1 shows these forces acting on a developed section of the worm thread. For simplicity the pressure angle has been assumed to be zero.

The coefficient of friction of the worm and gear is a function of the materials, finish, lubrication and rubbing speed. The latter is the relative speed between a point on the pitch surface of the gear and one on the pitch surface of the worm. The coefficient of friction varies very little at high rubbing speeds but rises with increasing rapidity as the speed drops below 500 fpm.

The efficiency formula developed in Figure 1 involves worm lead angle and the friction angle. Figure 2 provides a relationship between friction angle and rubbing speed based on tests made on accurately manufactured gearing consisting of hardened and ground worm and bronze gear operating in oil.

The formula for rubbing speed is: $V = \frac{.262 \text{ Dw x } \eta}{\text{Cos } \gamma}$ where V = Rubbing speed - feet per minute Dw = Worm pitch diameter - inches $\eta = \text{ Worm speed } - \text{ rpm}$ $\gamma = \text{ Worm lead angle}$

Development of equation for efficiency at contact between worm and gear



F=TANGENTIAL FORCE ACTING ON GEAR F TAN ($\gamma+\theta$) = TANGENTIAL FORCE APPLIED TO WORM F SEC ($\gamma+\theta$) COS $\theta=$ FORCE NORMAL TO CONTACT SURFACE F SEC ($\gamma+\theta$) SIN $\theta=$ FRICTIONAL FORCE

 $\begin{array}{ll} \text{EFFICIENCY} = & \frac{\text{WORK REALIZED}}{\text{WORK APPLIED}} \\ = & \frac{\text{L} \times \text{F}}{\text{L COT } \gamma \times \text{F TAN } (\gamma + \theta)} \\ = & \frac{\text{TAN } \gamma}{\text{TAN } (\gamma + \theta)} \end{array}$

FIGURE 2. FRICTION ANGLE θ

8°32′ 7° 6° 5° 4° 3° 2° 1° 48′

0 1 5 10 100 200 500 1000 1500 2000 2500 3000

RUBBING SPEED FEET PER MINUTE

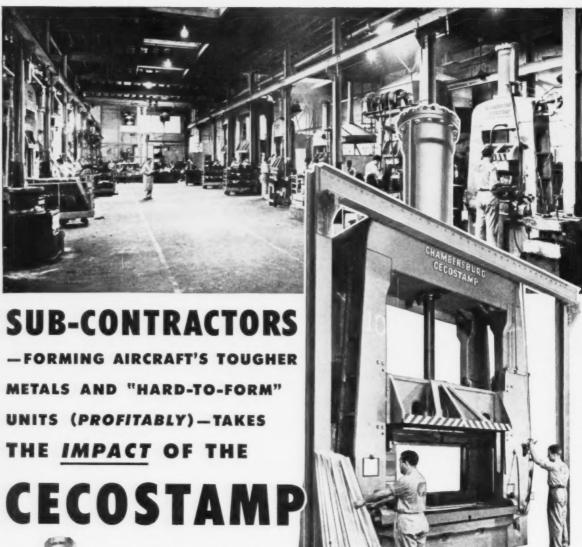


DE LAVAL Worm Gear Speed Reducers Offer Efficiencies to 96%

Ruggedly built for long efficient service De Laval speed reducers are made in horizontal and vertical single reduction units in ratios of 3:1 to 100:1. They are also available in double horizontal and vertical double reduction units as well as in helical-worm and double-worm design. Ratios from 37.8:1 up to 6400:1.



Write for your copies of Catalogs G-WBV and G-WWH to De Laval Steam Turbine Company, Trenton 2, New Jersey.



Here's a quick way to increase capacity without sacrificing quality or accuracy. Add a Cecostamp to Subcontractors throughout the industry, like

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the Aircraft Division of the Ledkote
Products Co. of New York, illustrated
above, are finding, profitably, the value
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Cecostamps. Cecostamps were originally designed for, and have kept pace
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requirements. There are standard

Cecostamps with working areas from 21"x18" to 120"x120" to fit nearly every metal shop need. The investment is a reasonable one, and deliveries can usually be arranged to suit your production needs.

view of shop at the Aircraft Division of the Ledkote Products Co. of New York, Inc., Long Island City, N.Y.

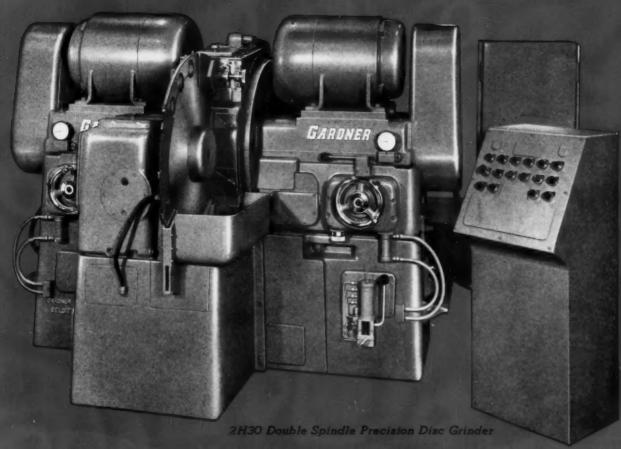
If you're smart, you'll give this a lot of thought. Why not send for Bulletin 30-L-5?

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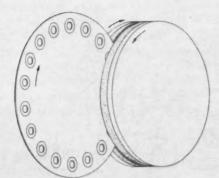


Production report on new Gardner Disc Grinder:

Grinds 2100 thrust washers per hour

TWO parallel surfaces ground in ONE operation





New design of 2H30 with heavier construction and greater stability produces faster and to closer tolerances . . .

production data:

Workpiece: Mild steel thrust washer: hardened;

3.00" O.D. x 1.75" I.D. x 0.093" thick

Rate: 2100 parts per hour

Stock Removal: .005" overall 1st cut

.002" to .003" overall 2nd cut

GARDNER

precision disc grinders

BELOIT, WISCONSIN



"Our Schiess vertical boring mill DOES THE JOB 3 TIMES FASTER, MORE ACCURATELY, with a BETTER FINISH!"

Hahn Manufacturing Company, 5332 Hamilton Ave., Cleveland

Jobs of increased size and time limitations no longer hold back production at Hahn Manufacturing Company.

The company reports: "Our Schiess machine has already handled a 60" high cast iron cylinder and a 108" diameter ship propeller. We cut production time by using the two boring heads together. For instance, one head can be used for roughing while the other is finishing. Or one head can be used for turning while the other is boring.

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was needed. Our regular machinists put it right to work as soon as they learned the controls.

"The Schiess mill does our big jobs just about three times faster, provides a better finish, is more accurate and results in less spoilage."

Get to know this product of Europe's largest builder of heavy machine tools. Parts and service are as close as Pittsburgh. An American Schiess engineer will be happy to help you size up this heavy producer for your heavy production needs.

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Standard Model KZ Double Column Vertical boring mills are available with 80", 98" and 118" turning diameters.

SCHIESS

AMERICAN SCHIESS CORPORATION . 1232 Penn Avenue, Pittsburgh 22, Pa.





These collets are used in machining the anchoring end of jet engine turbine blades, while locating the part from reference points on the airfoil section of the blade. It's a job that demands a steel which will not distort during heat treatment. The collet head is heated to Rockwell 58-60 C—the body tempered to 35-38 C.

The steel used is a special Crucible non-warping alloy collet grade. The collet manufacturer, Balas Collet Mfg. Co., Cleveland, Ohio, reports: The extreme accuracy built into these collets while they are still in the soft state shows less than .0005" dis-

tortion on any dimension after heat treatment.

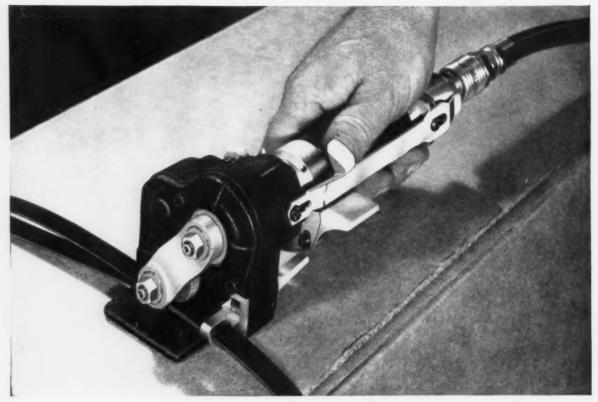
Crucible collet steel was developed specifically for spring collets—or any parts with rigid requirements of excellent machinability and high attainable hardness. Other properties—in almost limitless combination—can be had in other Crucible alloy grades. To see what information is available on these alloy steels—or any Crucible special steel—get your copy of the Crucible Publication Catalog. Write Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

Visit us at Booth 354
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first name in special purpose steels

Crucible Steel Company of America



PROGRESS: A better tensional stretcher to speed up your strapping operation



For complete information on the PNE Stretcher or any one of these 378 items mentioned above, write . . .

This new air-powered PNE Stretcher brings "production line" efficiency to packaging applications using any size of tensional strapping. It provides unlimited take up at predetermined tensions. Thus operator fatigue is reduced and tensioning errors are considerably lessened. A PNE Stretcher is available for every tensional width, and each tool adjusts to all gauges in the width it handles.

A continuing program of improvement and development of strapping materials and equipment is an established policy with Brainard. For example, the Brainard strapping line includes over 378 items to provide you with the finest available modern strapping facilities. A Brainard-trained Sales Engineer is on call in every major city to help develop maximum efficiency in your strapping operation.

Brainard Steel Strapping

Brainard Steel Division, Sharon Steel Corporation Griswold Street, Warren, Ohio





"Dave, that Dow Methylene Chloride sure cured our stripping problems with masking lacquer"

"It sure did, Jess. It takes minutes to do jobs that other cleaning and stripping compounds take *hours* to do."

"Wonder why?"

"Two reasons. One is high solvent power. Dow Methylene Chloride penetrates coatings faster. The other is that it immediately starts an evenly distributed lifting action that really loosens things up."

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"It's nonflammable and carries a low toxicity rating-the MAC is 500 ppm. Very stable, too!"

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"That's all I know, but the Dow people can answer all your questions. Why don't you write them a note?"

"Who?"

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Have you been bogged down with paper work lately, thereby missing a chance to save money by streamlining your wire buying?

Your American Steel & Wire representative can be of immense help if you give him a call. For example, he may be able to suggest more economical buying units or packaging specifications, or find one type of wire that will do the job of two. Turn him loose in the plant, because

he might find a lower cost way of doing the job—with a better product the result.

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AMERSPRING —music steel spring wire,

AMERTEMP —heavy-duty oiltempered wire.

AMERLOY —alloy heading wire.

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UNITED STATES STEEL

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To meet the specialized requirements of the primary metals industry, B&W manufactures Silicon Carbide Refractories in a variety of shapes and sizes. These durable refractories are produced in B&W's Augusta, Ga., works to the same rigid quality control standards used in making all B&W Refractories. See your local B&W Refractories Engineer for further information.



B&W Silicon Carbide Rolls



B&W Silicon Carbide Recuperator Tubes



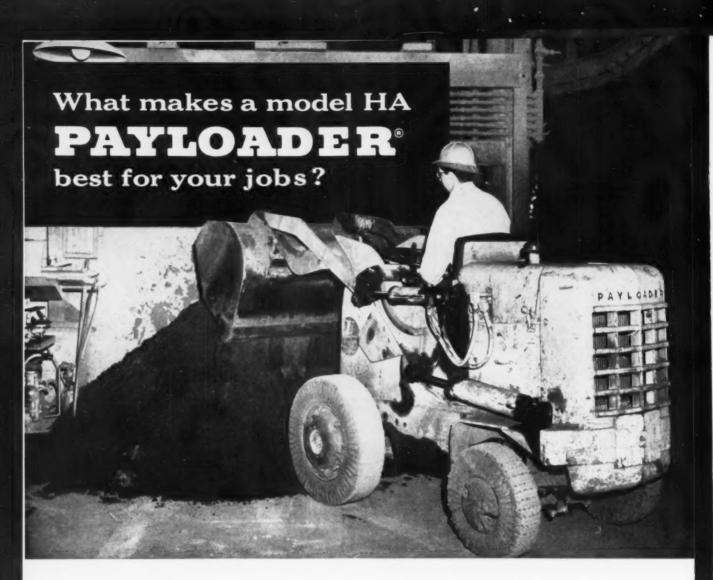
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- Models HA (18 cu. ft.) and HAH (1 cu. yd.) Larger models up to 21/4 cu. yd.

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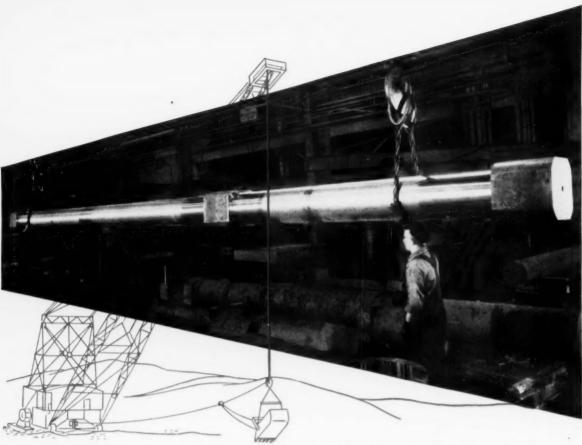
Foundries and industrial plants report that the new model HA "PAYLOADER" is not only a great improvement over earlier models but is also way ahead of other front-end loaders in design and productivity - can dig more, carry more and deliver more tons of material per hour than heavier machines with larger engines. The exclusive 40° tip-back breakout action of the bucket at ground level gets and holds big loads close and low without spilling. Hydraulic load-shock-absorber smooths the ride and permits higher travel speeds. The low-mounted boom arm design makes operation faster, safer and easier because operator cannot get caught in mechanism and his line of vision is clear. Exclusive one-lever bucket control tips back, raises, dumps and lowers the bucket for simple, easy operation. Your nearby Distributor is ready to demonstrate the model HA or a larger "PAYLOADER" from the complete line.



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For over 78 years, Finkl has produced the best in cylinders, spindles, driveshafts, and special forgings both rough turned and finish machined. When you are considering forgings or die blocks, call your local Finkl representative.

A. Finkl & Sons Co.

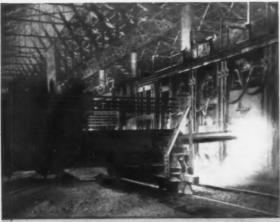
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Plus

CLAYMONT'S FABRICATION SERVICE...

welding ... shearing. As a result, you can in effect supplement your own equipment with Claymont's extensive fabrication facilities.

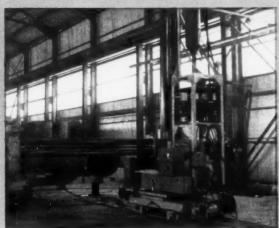
And you avoid paying freight and handling charges on that part of your plate that would only become scrap.



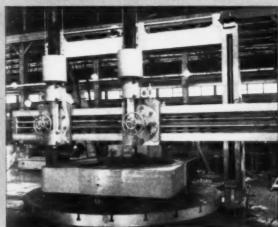
Enjoy the advantages of big bending rolls, press brakes and other heavy equipment. Just let Claymont perform some of your heavy-duty operations before your Claymont Alloy Plate ever leaves the mill.



Supplement your burning equipment with Claymont's radiagraphs. You can get steel circle parts . . . without costly scrap losses . . . by letting Claymont's Fabrication service do the job for you.



Save money on many of your welding jobs. Take advantage of this automatic welding machine. With such equipment, Claymont specializes in uniform welding.



Add to your machine shop equipment at no extra cost. For instance, you gain all of the advantages of this modern 16-foot boring mill . . . at a price that'll help you show a tidy profit . . . If you're one of Claymont's Fabrication service customers.

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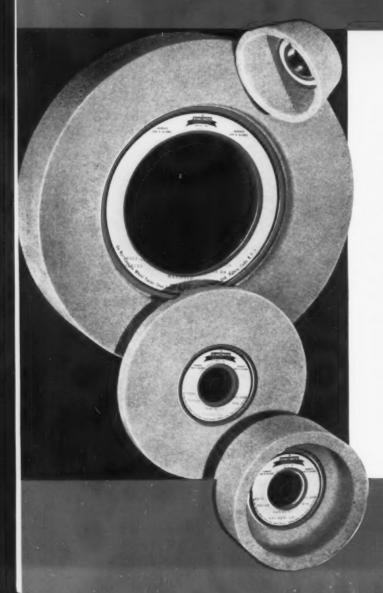
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SA Borolon is a single crystal aluminum oxide abrasive possessing superior qualities over conventional white aluminum oxide abrasive. It is produced from a furnace charge consisting of a molten base with a soluble matrix which dissolves, leaving single natural crystals of abrasive grain without crushing.

Being single, natural crystals, each abrasive particle of SA Borolon is free of the inner stresses and strains to which multi-crystal, crushed abrasive is subjected under grinding pressures. Also, each abrasive particle contains more cutting edges, which permits greater penetration into the work and faster grinding. SA Borolon has the greatest surface hardness yet achieved with aluminum oxide type abrasives. Write for illustrated Catalog Bulletin ESA-272.

New and better

for tool and cutter grinding



COOLER GRINDING

Because of its tough, hard crystal structure, SA Borolon bites into the work, and fractures before point dulling can set up frictional drag, with consequent risk of damage to steel temper.

FASTER CUTTING

Because SA Borolon is made up of a single, unbroken crystal with multiple cutting faces, over its entire surface it provides a regular sequence of sharp edges on the wheel face. This differs radically from ordinary blocky grain in which blunt faces are interspersed with cutting edges.

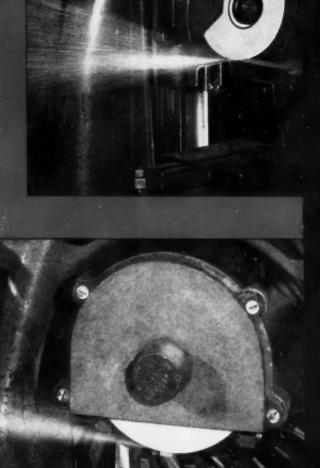
LONGER LIFE

Because SA Borolon has (1) increased resistance to dulling and (2) fractures so as to increase the "self-sharpening" feature of the wheel, less dressing is required and wheel life is prolonged.

BETTER FINISH

The sharp, free, cool-cutting action inherent in the single crystal structure of SA Borolon, means improved finish on *your* toolroom grinding jobs.





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Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

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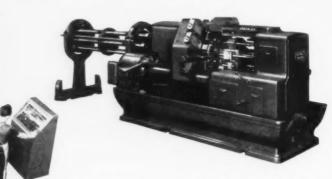
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Creative manufacturing begins with creative planning. Baffling problems of production have a way of disappearing when you invite Greenlee engineers to participate in your preliminary planning. These men are well acquainted with the mechanics and economics of mass production. Their thinking is sound . . . creative. It will pay you to investigate. Write or phone for a consultation today.



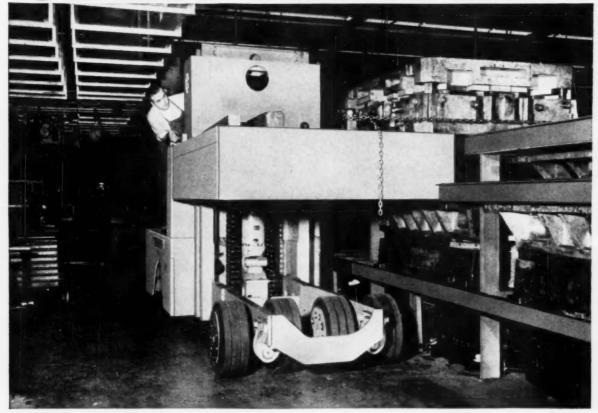
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loads and greater maneuverability in congested areas ...dual drive controls (optional) allow operation from either side of the truck, thus providing full visibility under all working conditions.

Check handling operations throughout your plant and find out how Yale Trucks can speed the movement of materials, increase production-at the same time boost the safety factor in moving big loads. For complete information, contact your Yale representative or send coupon below.

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Gasoline, Electric & LP-Gas Industrial Lift Trucks · Worksavers Warehousers . Hand Trucks . Hand and Electric Hoists

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Please send me Yale's booklet "Giant Handlers For The Metals Industries".

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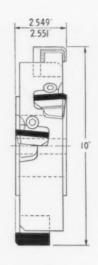
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1NGERSOLL CUTTER removes 2700 cu. in. of 1045 steel without resharpening at The Bullard Company

This ten inch, inserted blade, staggered tooth channeling cutter used by The Bullard Company, manufacturers of machine tools in Bridgeport, Connecticut, demonstrates long tool life of Ingersoll cutters on tough jobs. The cuts are $2\frac{1}{2}$ " wide. $1\frac{2}{3}$ " deep at a cutting feed rate of 6" per minute. The parts to be cut are $67\frac{5}{3}$ %" long tool slides for the Bullard "Cut-Master" turret lathe.

The advantages of long life and dollar savings made possible by Ingersoll inserted blade cutters are being realized on all makes of machines, milling and boring a wide range of materials. An Ingersoll Cutter Division representative will be glad to discuss this and other long-tool-life experiences with you.

Whether you are concerned with tool life, feed rates, cutter costs or finish, the new Ingersoll cutter catalog will be a valuable guide. Write for your copy today, address Dept. 66N.



Use this new 82 page guide for selecting the <u>right</u> inserted blade milling and boring cutters for <u>your</u> work. Write for catalog #66, today.

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Bristol, Co



SPOOLING OPERATION—Coils of Youngstown Wire are placed on winches from which the wire passes over a sheave and guide onto the bobbin in the foreground.



STRANDING OPERATION—Filled bobbins are placed in the stranding machines for forming the individual wires into strands. In these machines from 7 to 41 bobbins are placed, all wires emerging at the forward end being formed into a single strand which passes over the draw works and onto the larger bobbin shown at right.

YOUNGSTOWN "YOLECTRO" ROPE WIRE

... helps' maintain high quality of Broderick Bascom Yellow Strand wire rope

For over half-a-century Broderick & Bascom Yellow Strand wire rope has enjoyed a world-wide reputation for excellence of both workmanship and finished product. To maintain their high quality standards, they use Youngstown "Yolectro" High Carbon Rope Wire as the basic material in the production of their various brands of wire rope. They have found over the years that it offers the required toughness and strength, abrasion resistance, gage uniformity, and flexibility to guarantee a Broderick & Bascom product of consistent quality.

"Yolectro" High Carbon Rope Wire is quality-controlled to provide the correct balance of properties to meet your most critical requirements. Why not make it your specification for quality production? It's available in both Bright and Galvanized finishes in all high carbon grades.

Metallurgical assistance or additional information may be received from your nearest Youngstown District Sales Office. Why not write or phone today?

CLOSING OPERATION—In this machine, six finished strands are formed around a center core of either fiber or independent wire rope.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio District Sales Offices in Principal Cities



Producers of Quality Carbon and Alloy Steels for Over Half-a-Century



Replaces 4 tools...

Sets nuts 30% faster

• Application: This new Rotor J-2-L Impact Wrench with a quick-change chuck does the work of four former tools. By snapping in different adapters, the operator can change quickly from a screw to a bolt or nut. Result: 30% faster assembly, less operator fatigue, uniformity of assembly.

Ask for a demonstration or trial of these and other Rotor portable tools to see how they can cut your costs! Get Bulletin 41 on the J-2-L. The ROTOR TOOL Company, Cleveland 32, Ohio.

Here's the Right
TOOL for YOUR job!

Rotor Air Tools: Assembly Tools • Drills • Small Wheel Grinders Straight Grinders • Vertical Grinders • Scalers • Chippers • Rammers Rotor High-Cycle Electric Tools: Grinders • Polishers • Sanders



STOTOR SCLEVELAND, OHIO



THE IRON AGE

2,300,000 pounds ship-to-shore in one hour!

Westinghouse-equipped ore unloaders set new highs in speed and dependability for McLouth Steel

Power. Durability. Precision. These were the requirements for the motors and controls to operate these two 547-foot ore bridges for McLouth Steel. Westinghouse supplied the solution with rugged MC mill motors and the newest developments in automatic controls—Magamp* and Rototrol®.

In just 41 seconds, these ore bridges run a complete cycle-digging, hoisting, trolleying,

dumping, rehoisting and back again for another 27,000-pound scoop.

It will pay you to investigate the facts that give such outstanding results as these when you are considering motors, drives and controls. Get the details from your Westinghouse sales engineer. Or write Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pennsylvania.

*Trade-Mark

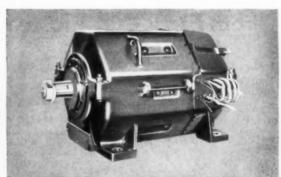
YOU CAN BE SURE ... IF IT'S

Westinghouse

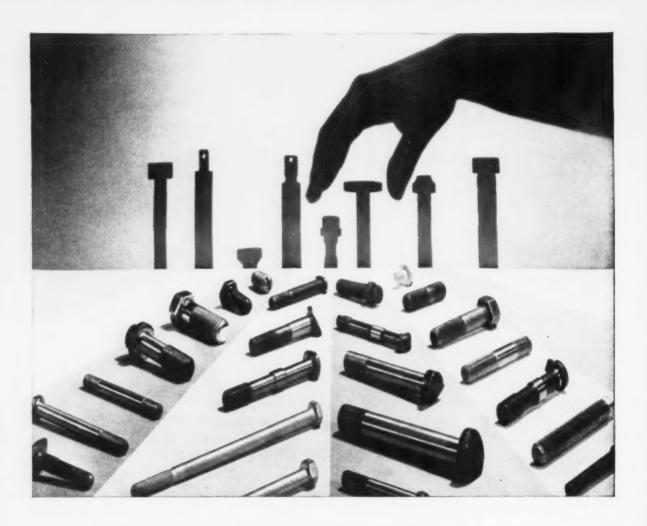




These two new ore bridges can unload all size boats by means of an adjustable "apron" which can be raised high enough to allow the mast of any vessel to pass underneath. Dependable Westinghouse hold-and-close motors carry the load on this modern installation.



Rated at 187½ hp, 230 v, 460 rpm, this 616 Series mill motor gives the kind of outstanding performance to meet today's tougher, faster jobs. Westinghouse engineers are ready to work with you to give you the best motors and controls for your needs.



IMPROVE DESIGN... get assistance from Ferry Cap—fastener experts for 50 years

Often we can suggest a fastener of special shape that will reduce your over-all product costs. Sometimes these special screws eliminate parts, replace more expensive parts, or reduce assembly time. Frequently they improve product performance. In all cases, Ferry Cap customers get the benefit.

Give us a call and have a talk with one of our "Fastener Engineers."

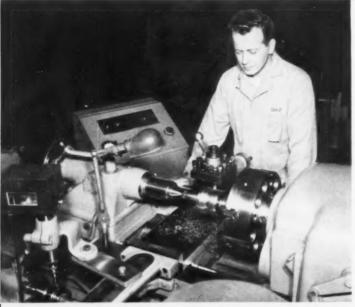
THE FERRY CAP & SET SCREW COMPANY

Makers of the famous Countr-Bor® Screw for socket head applications.
2157 SCRANTON ROAD • CLEVELAND 13, OHIO



is geared to FASTER SERVICE





Machining time—
cut 40%!
Grinding time—
cut 50%!
Grinding wheel cost—
cut 25%!

HERE'S TOP FORM TURNING!

















Wouldn't you welcome savings like these? S. K. F. Industries, Inc. does, and their happy secret is shown above in an action shot of their Monarch 16" Series 61 Lathe with Keller controls turning circular form tools from the solid. The figures contrast present against previous production on conventional machines, so widely and wastefully used for this work.

Point is, instead of leaving large amount of stock for final grinding, S. K. F. finds that accuracy of new Monarch with Keller controls enables them to turn and shape directly from the solid within about .0005" of finish size. And less-skilled operators can machine them faster—before less grinding.

You can't miss savings like these! Challenge us to deliver you better production whatever you turn—and prove it... The Monarch Machine Tool Company, Sidney, Ohio

• While flat templates are generally employed with Keller controls, S. K. F. achieves the necessary high accuracy by so positioning master work pieces between centers that stylus follows sharp edge of gash in form tool master. Another savings.



FOR A BETTER TURN FASTER ...TURN TO MONARCH

The very high strength of USS "T-1" Steel has helped Athey Products Corporation, Chicago, Illinois, to solve the problem of providing a high-volume trailer for hauling lightweight materials such as bauxite ore. This new reardump trailer is bigger than conventional units, yet...

WEIGHS 31/2 TONS LESS

The very high yield strength of USS "T-1" Steel—90,000 psi minimum—enabled Athey to increase working stresses and reduce the thickness and weight of drawbar and draft frame structure and of all load-containing body plates. As a result, this unit weighs just 26,000 pounds—7,000 pounds less than conventional units—and, consequently, it . . .

TRAVELS FASTER

It can make empty trips much faster . . . can negotiate steep grades in one higher transmission speed than conventional units. Even with a full load of 35 tons, this lightweight unit can climb 14% grades in second gear. By reducing weight, USS "T-1" Steel speeds operations, cuts non-productive time, and makes possible a larger trailer that . . .

CARRIES MORE PAYLOAD

This trailer has the lowest ratio of vehicle weight to load weight ever designed . . . and carries a full 30.5 cu. yds.—8 yards more than conventional units of the same weight-carrying capacity. It promises to increase, materially, the efficiency of hauling <code>lightweight</code> materials . . .

USS CONSTRUCTIONAL ALLOY STEEL

USS "T-1" Steel's toughness and resistance to impact abuse assure Athey the ruggedness and durability needed in off-road mountain service. Its excellent weldability kept fabrication simple.

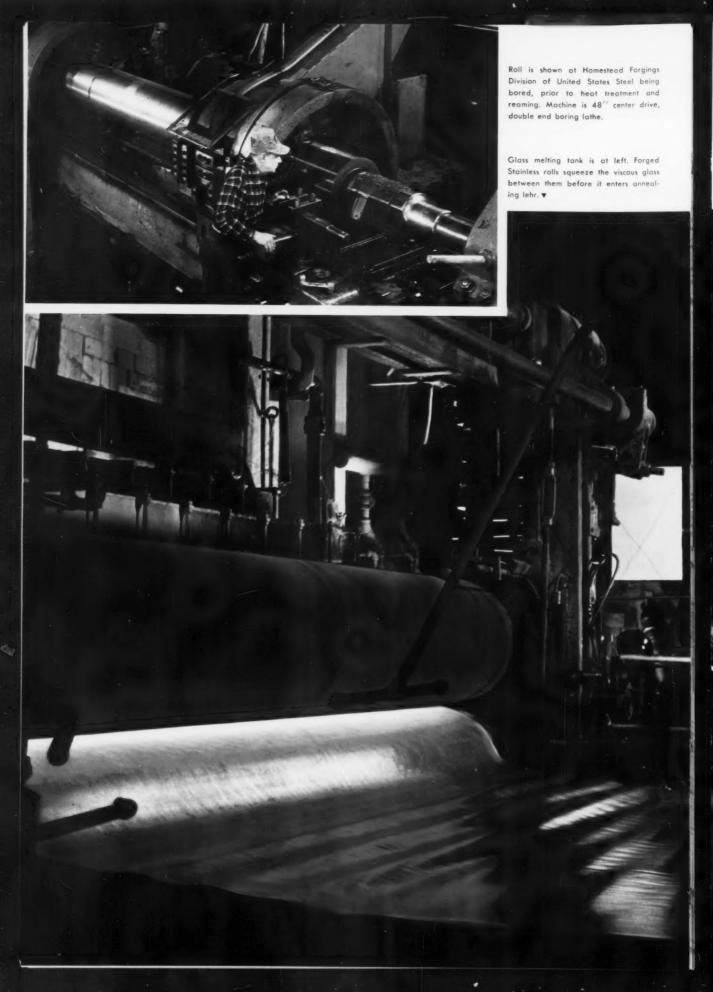
USS "T-1" Steel can help you in a wide variety of heavy-duty applications. Get complete facts—call our nearest sales office, or write to: United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.



See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your newspaper for time and station,



UNITED STATES STEEL CORPORATION, PITTSBURGH - COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST - UNITED STATES STEEL EXPORT COMPANY, NEW YORK



rolls glass at 2000°F with Stainless Steel rolls



In a sizzling race to keep up with the demand for flat glass, Pittsburgh Plate Glass Company is rapidly building new factories and increasing the output of old ones. But you cannot increase the output of an existing factory unless you can somehow get more glass from the melting tanks.

Since plate glass must pass between a pair of rolls as it emerges from the tank, the rolls must turn faster when production is increased. If they turn faster, it is more difficult to dissipate the heat from the molten glass. The answer is better rolls. And when you're thinking in terms of better rolls for hot work, stainless steel forgings are the answer.

Pittsburgh Plate has found that USS Quality Forging rolls have suitable physical properties and microstructure that are so necessary for this job. They are made from Type 410 Stainless Steel, and are remarkably resistant to surface cracking and checking. The rolls are water cooled internally, and there is naturally a steep temperature gradient from O.D. to I.D. The forged rolls resist pitting and oxidation. They retain their dimensions during the 24-hour-a-day glassmaking process.

Pittsburgh Plate has had one set of these rolls in continuous service for two years, and they have already produced *millions* of square feet of glass. Similar rolls will also be installed in their revolutionary new Cumberland, Md. plant.

Write today for our free booklet that describes USS Quality Forgings. Address inquiries or requests for the booklet to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

USS QUALITY FORGINGS



heavy machinery parts—carbon, alloy, stainless forged steel rolls and back-up roll sleeves electrical and water wheel shafts specialty forgings of all types

UNITED STATES STEEL

USS MX — fastest free-machining screw stock — at no extra cost!



"GRADE MARKED" FOR YOUR CONVENIENCE!

Rounds · Hexagons · Squares



- The grade of each lot is clearly marked on the seal!
- Takes the guesswork out of bar selection lessens the chance of mistakes—saves time all along the line!
- Another reason why U. S. STEEL SUPPLY is the place to buy!

Quick delivery from our nearest warehouse puts you in position to cash in on many advantages of this remarkable screw stock!

If you are interested in turning out more parts per hour, switch to USS MX Free-Machining Screw Steel. This is possible because MX will take cutting speeds up to 50% higher than with regular Bessemer grades. This faster machinability has enabled hundreds of shops to boost production from 10 to 50%. And they have gotten up to 200% longer tool life. This means that MX will cut the cost of any part you now machine from ordinary screw stock.

You pay no more for these benefits. By increasing the rate of production, MX lowers the cost per part . . . by prolonging tool life, MX reduces down time . . . by assur-

ing better finish, MX eliminates extra finishing operations . . . and by providing closer dimensional accuracy, MX helps to eliminate rejects.

U. 5. Steel Supply can give you quick delivery on this remarkable screw stock in both Bessemer and Open Hearth Grades . . . in all the popular sizes and shapes. In addition, each lot in your order is neatly strapped and the seal identifies the lot as to grade. This is what we mean when we say "Grade Mark Service." It saves you time in identifying and stocking screw stock you buy from U. S. Steel Supply. All orders filled from warehouse nearest point of delivery.

U. S. STEEL SUPPLY

DIVISION

General Offices: 208 So. La Salle St., Chicago 4, III.



Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

A whale of a hook: Monel alloy's strength, corrosion resistance, and weldability assure lightweight design...long life. Youngstown Welding & Engineering Company fabricated the hook section at left entirely of Monel; the lifting beam is Monel-sheathed steel.

Giant hairpins to lift 3 tons:

Youngstown builds high-capacity hooks of Monel...for extra years of pickling

This hairpin hook ... and 37 like it ... will carry 6,000-pound loads along the pickling line of a major wire producer.

A big hook, indeed! Big and tough, it lifts twice its own weight. Yet it's light for the work it does.

A close look shows you why. Youngstown has welded together thin sections of sturdy, wrought Monel* nickel-copper alloy plate and bar . . . to achieve maximum payload, minimum deadweight.

Why Monel pays off with greater payloads

Three reasons. First, Monel alloy is strong... the strongest non-ferrous metal used for pickling equipment. Second, it resists corrosion by the

common pickling solutions...eliminates need for extra metal as corrosion allowance. Third, it is readily fabricated...easy to weld.

These properties mean longer service, too

The combination of strength and corrosion resistance of Monel that holds down deadweight also adds years to the life of pickling equipment. That's a matter of record in plant after plant.

It's already a matter of record for the purchaser of Youngstown's 38 giants. In another of this company's mills, Monel hooks outlasted another construction in seven years of side-by-side service on a heavy pickling line. In fact, those Monel hooks are still in excellent condition.

Expect Monel equipment to save money on your pickling line . . . by carrying heavy loads with minimum deadweight, by lasting longer. "Equipping the Pickle House for Greater Production at Lower Cost" . . . an informative 32-page booklet . . . shows you where and how. For your copy, write:

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.



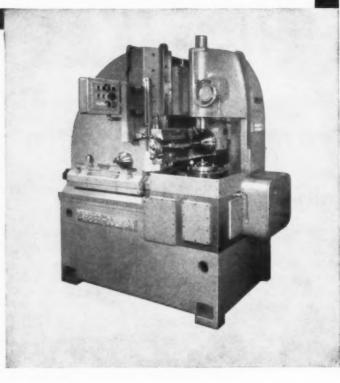
Monel... for proved pickling life

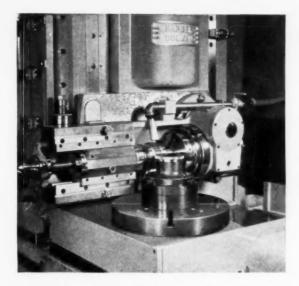
a new concept of gear accuracy!

Barber • Colman Builds World's Most Accurate

Hobbing Machine

First
hobbing machine
ever guaranteed
to cut gears
within 10 seconds
angular error





Barber-Colman has designed and built, in collaboration with Sperry Gyroscope engineers, a new type of hobbing machine which hobs without any further finishing operation, gears for the most accurate radar, navigational and computing equipment. This machine is known as the "Ultracision" Hobbing Machine and is so accurate that gears cut by it will transmit motion within 10 seconds of true angular rotation. This is equivalent to .0001" on 4" diameter, which is the only size that has been thoroughly investigated at the present time. This means that the combination of lead, profile and spacing errors measured over non-adjacent teeth cannot exceed 10 seconds of true angular displacement at any diameter along the involute.

In order to arrive at this degree of precision, it has been necessary to provide new methods of positively checking such accuracy. Sperry engineers utilize theodolites and auto-collimators in conjunction with pneumatic, electronic and mechanical gaging equipment which assures accurate measurement within millionths of an inch.

the machine

To produce gears of this accuracy, many new and unusual features have been incorporated in the hobbing machine. The greatest care in manufacture and assembly has been used for all parts. All vital surfaces on the machine are scraped within .0001" per foot, and even the covers are scraped to fit the scraped portions of the bed casting to prevent entry of foreign matter.

Since the machine is designed to cut only spur gears, the feed drive is independent of the main drive. Capacity of the machine is 10" diameter blanks, 6" maximum length of hob carriage travel, and maximum rated pitch capacity of 32 DP. Drives to the work and hob spindles have been made as short as possible to minimize any twisting and vibration. An extremely accurate index worm and gear are mounted in ultra-precision taper roller bearings. Except for the index change gears, the gear train between the main drive shaft and the index worm contains only a worm and worm gear, and a pair of 90° helical gears.

The basic machine weighs 11,000 lbs., (with controls 13,800 lbs.) to provide the rigidity necessary for this exceptional accuracy. Another feature for increased rigidity and accuracy is the elimination of a hob slide. The hob is mounted directly on an expanding arbor, and shifted on this arbor, rather than by means of a hob slide.

Adjustments are provided for trueing the hob spindle within a few millionths of an inch. Both hob spindle and outboard support are mounted in ultra-precision taper roller bearings.

the hobs

To attain extreme profile accuracy on the gear teeth, Barber-Colman also has developed a new class of hob called "Ultracision", and made to limits of .00008" lead variation in one axial pitch, and .00015" in 3 axial pitches. These limits are just half of those for Class AA hobs. These hobs are ground and have larger than standard diameters to permit a greater number of hob teeth for very fine finish on the gear tooth profiles. Wide hubs and a 2" diameter straight bore provide maximum rigidity for the hob.

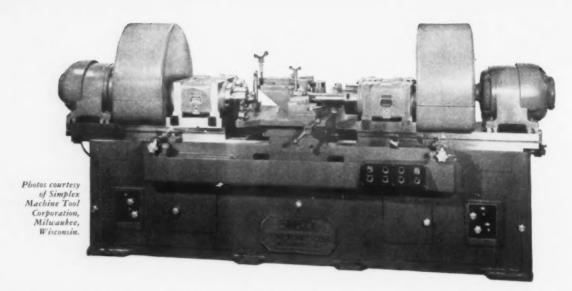
The development of this new concept in gear accuracy—the finest limits of gear accuracy ever obtained on a production basis—will eventually reflect in a higher standard of quality for gears produced on standard production hobbing machines. You are invited to submit your gear specifications and problems for analysis and recommendations by our engineers. Detailed information on the new "Ultracision" Hobbing Machine is available on request.

BARBER-COLMAN COMPANY

643 ROCK STREET . ROCKFORD, ILLINOIS

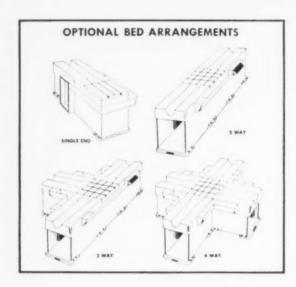
Hobs · Cutters · Reamers · Hobbing Machines · Hob Sharpening Machines





VERSATILITY FOR MACHINE TOOLS

Welded design does it at less cost



These precision boring machines can have one to four boring heads. The beds may vary in length . . . depending on the customers' needs. Such versatility in design and manufacture is made possible with welded steel . . . because:

- A welded base design can be easily and quickly modified since there are no patterns involved.
- Less material is needed since steel is three times stronger than iron, 2½ times as rigid . . . yet costs a third as much per pound.
- Less machining, less finishing is needed.

Basic advantages like these can be applied to many products. A Lincoln engineer who is backed by 45 years of Lincoln cost-cutting experience, will gladly show you how to benefit.

Write for Weldesign Bulletin, available to product designers.

THE LINCOLN ELECTRIC COMPANY

Dept. 1529, Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

When steel is three times stronger than iron

Has much more versatility

Yet costs much less aren't your products designed for welded steel?



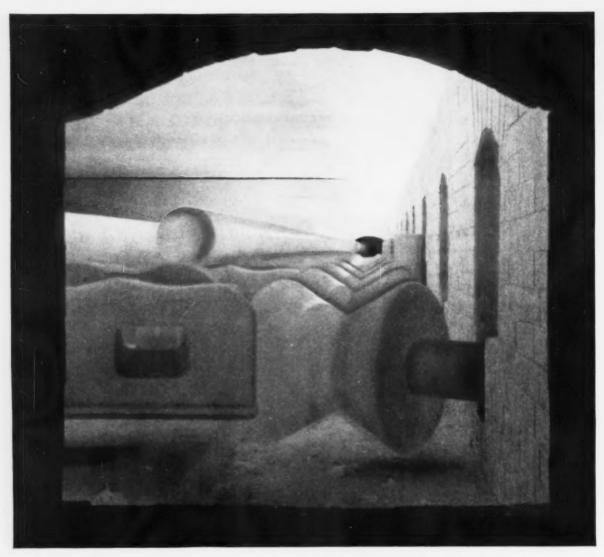
You buy near-perfection when you specify this Jessop steel

If you visit the Jessop Specialties Division, you'll be immediately impressed with the clean, quiet lab-like atmosphere, the intensity of effort and care that personifies true craftsmanship. For here Jessop processes fine Truform oil or Windsor air hardening tool steel into one of its top products . . . precision ground flat stock used for the production of highly accurate dies, gages, cutters, machine parts, straight edges or the like. This Jessop product comes as close to perfection as the steelmaker's art logically allows. Each piece, of any size, is highly-finished, dead flat and square, and guaranteed to have a thickness tolerance of plus or minus .001 and a width tolerance of plus .005, minus .000. An inspector double checks the analysis with a delicate Magnetic Analysis Production Comparator and a Profilometer is used for inspection of the finish. After all tests are passed, the stock is carefully wrapped for shipment to Jessop customers all over the world. If you have any application for this type of product, it will pay you to send in an inquiry. Jessop's pride of accomplishment will make it a better buy for you.

JESSOP STEEL COMPANY • WASHINGTON, PA.

OFFICES IN PRINCIPAL CITIES

Jessop Steel of Canada Limited, Wallaceburg, Toronto
Jessop Steel International Corp., Chrysler Building, New York, New York



Interior of a high temperature, hearth type Gas furnace specially designed for heat treating high strength steel casing

J&L speeds production, decreases costs...thanks to GAS

This Gas furnace at Jones & Laughlin Steel Corporation, Aliquippa Works, Pennsylvania, assures high strength characteristics formerly attained by adjusting the chemical composition of the steel. With Gas, J&L speeds production of special high strength seamless tubular products. Heat treating these products with Gas also saves tons of strategic materials like manganese, molybdenum and

chromium, formerly used in the production of high strength seamless pipe.

For information on how Gas can help you with your production problems, call your Gas Company's industrial specialist. He'll be glad to discuss with you the economies and outstanding results you get with Gas and modern Gas industrial equipment. American Gas Association.

new help for you!

Gulf Petro-engineering Service

... now available to all users of petroleum products





Proper engine tune-up procedures mean maximum fuel economy in fleet operations. Gulf Sales Engineers work closely with fleet maintenance superintendents to help save fuel, lengthen periods between overhauls, and increase availability of equipment.

Gulf Sales Engineers can provide practical assistance to paper mill operators on any process or problem that involves petroleum products.



Gulf Petro

brings you practical involving the use of

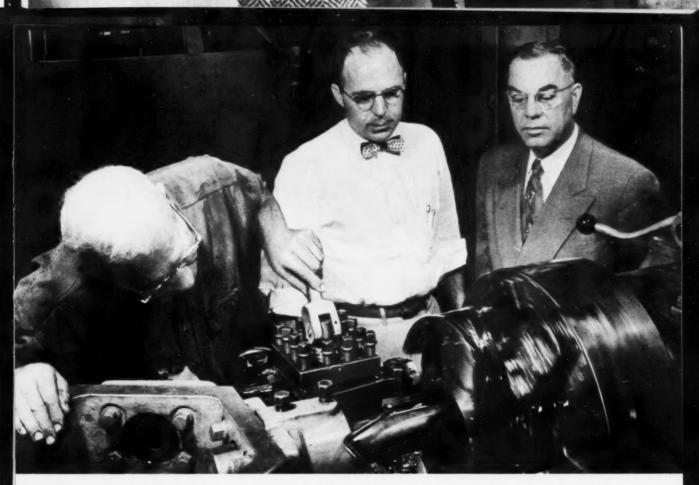
If you are engaged in manufacturing, mining or quarrying . . . construction or transportation . . . communication or public utility service—you can profit from Gulf Petro-engineering Service.

All of these fields use petroleum products. Many problems arise in connection with their use—problems of proper selection, of storage, of dispensing, of application schedules. And, most important of all, problems of equipment performance!

Very few companies, however, find it practical to hire or train qualified people to perform this specialized engineering job. Gulf offers you its own trained staff to assist you with these problems.

Gulf Petro-engineering Service puts a petroleum specialist in your plant or other base of operations to give you impartial, expert advice on any problem in any way related to the uses of petroleum products.

You can get Gulf Petro-engineering Service if you are



A Gulf Petro-engineering Service specialist can help you select the most suitable cutting fluid for each machining operation. Chances are he will find practical ways to improve production, increase tool life and lower costs.

-engineering Service

help on every problem and process petroleum products

a user of petroleum products—whether or not you have been buying those products from Gulf.

There is no charge for this service.

In essence, here's what Gulf Petro-engineering Service offers you . . .

- Expert help with any immediate problem involving use of any petroleum product.
- Practical help on any long-range problem, including those which may involve new uses or new types of petroleum products.
- A survey of your entire operation. Aim: to help you achieve greater efficiency and economy in the use of fuels, lubricants, cutting oils, rust preventives and process oils.

Gulf has a large group of trained and experienced sales engineers ready to serve you. The typical Gulf Sales Engineer who contacts you is a graduate engineer. He has been well-schooled in the formulation and uses of petroleum products. He has the versatility and invaluable knowledge that comes through many years of practical field experience.

If yours is a highly involved or difficult problem, he can enlist the help of another specialist—a Gulf Product Application Engineer.

Behind Gulf field representatives are more than 1,300 scientists, engineers, metallurgists and chemists at Gulf laboratories specializing in the manufacture and application of petroleum products. Their knowledge, coupled with the experience of field engineers, adds up to a broader, better service than has ever been offered before to industrial and commercial users of petroleum products.

Take advantage of Gulf's Petro-engineering Service now. Use the coupon on the next page to send for booklet describing the complete service—or write or call your nearest Gulf office.

Gulf Petro-engineering Service

can be put to work for you immediately on any or all of these problems. It can help you...

- Plan the installation of more efficient fuel and lubricant storage and dispensing facilities.
- Get maximum fuel economy through proper engine tune-up procedures.
- Obtain maximum heat or power from each gallon of fuel oil through more efficient combustion.
- Establish proper oil change periods.
- Cut maintenance costs through improved application of lubricants.

- Select rust preventives according to the exact kinds of protection you need.
- Eliminate or reduce oil vapors, sludge deposits and corrosion of fuel oil storage tanks.
- Reduce the number and variety of lubricants used.
- Establish proper flushing procedures for both old and new equipment.
- Control dust on plant grounds and parking lots.

If you are faced with any of these common problems or with any problems involving petroleum products in use—simply call your nearest Gulf District Office.

GULF OIL CORPORATION
Gulf Building, Pittsburgh 30, Pa.

- Send free Gulf Petro-engineering Service booklet.
- Have a Gulf Sales Engineer call.

Name Title

Company

City Zone State



GULF OIL CORPORATIONPittsburgh 30, Pa.

STAINLESS STEEL MAKES THE DIFFERENCE

...its effect on modern appliance design

Make it more attractive-longerlasting-easier to keep clean. And keep it simple to make. More and more designers "build in" such powerful selling points with stainless steel.

Stainless keeps pace with modern trends. Now there are more than 30 different types and a variety of textures, surface tones and colors. The hard-selling values of superior corrosion resistance, durability and toughness, long associated with stainless give you assurance of consumer acceptance at the point-of-sale.

For more facts about stainless steel and the contribution it can make to your product or marketing problems, see your stainless steel supplier or write ELECTROMET—leading producer of more than 100 alloys for the metal industries, including chromium and manganese used for making stainless steel. Ask for the booklet "Stainless Steel in Product Design." Address:

ELECTRO METALLURGICAL COMPANY

A Division of

Union Carbide and Carbon Corporation
30 E. 42nd Street New York 17, N.Y.
In Canada: Electro Metallurgical Company,
Division of Union Carbide Canada Limited,
Welland, Ontario

METALS DO MORE ALL THE TIME ...THANKS TO ALLOYS



FERRO-ALLOYS AND METALS

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.



Stainless steel styling adds the attractive, durable, "easy-to-clean" appeal which is helping to put across this new idea in cooking units.



how else could this job be handled so well?

Through exclusive features like these a Gerlinger fork lift truck enables each operator to multiply "manpower" and give you a new concept of profitable mass-handling:

- Exclusive Floating-Type Boom Action faster, friction-free lift
- · Counter-active Weight Distribution better traction and maneuverability
- · Pivotal Mounted Steering Assembly-
- stabilized load on any road Heavy-Duty Steel Channel Framebonus years of reliable service
- · Maximum-Power Torque Converter Drive-smoother operation, less wear

If you move and stack loads between a few hundred pounds and twenty tons, look to the combined Towmotor-Gerlinger line to meet the most diversified specifications. This great new combination brings you the most complete range of fork

lift truck capacities available from one source. More extensive service to match it, too.

Get catalog describing the lift trucks that will do the best job for you. Address: Gerlinger Carrier Co., Dallas, Oregon.

Leaders for 38 years in building Fork Lift Trucks and Carriers



Gerlinger Carrier Company, Dallas, Oregon is a subsidiary of Towmotor Corporation, Cleveland, Ohio

Going up...

with a <u>lift</u> from FRASSE stock tubing!

Faced with an almost impossible delivery deadline, the maker of this hydraulic elevator needed a 6" OD ram and a 5" OD ram to telescope. Then too, he knew that final sizing would consume valuable time. With Shelby seamless tubing specified — and speed essential...he put in a hurried call to Frasse.

Frasse not only made delivery *immediately* from stock—but was able to *select*, from commercial tolerance material, two tubes so close to final size that only minor honing and turning were necessary. This lift from Frasse stock tubing enabled the elevator to be completely installed, approved...and in operation, days sooner than had been anticipated.

Tubing stocks at Frasse are in good supply – and quick Frasse delivery helps you get jobs done faster. So, depend on a dependable tubing source – *call Frasse* whenever you need mechanical tubing, stainless tubing, hydraulic and pressure tubing, centrifugally spun tubing – or even a bit of assistance from Frasse tubing specialists. They'll be happy to work with you on any problem involving a tubular product.

Seamless and Welded Mechanical Tubing Pressure, Condenser and Hydraulic Tubes Stainless Tubing, Seamless and Welded Stainless Pipe, Valves and Fittings Aluminum Tubing, Pipe and Fittings PVC Plastic Pipe, Valves and Fittings

Frasse for Tubing...

Peter A.



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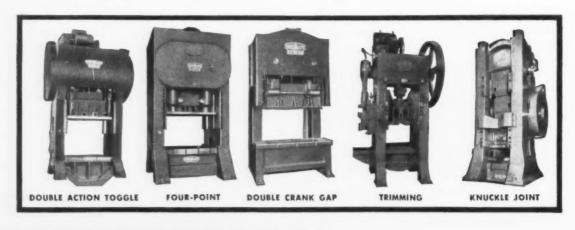
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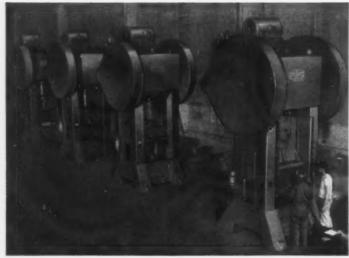
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Hartford 1, Conn. P.O. Box 1949 JAckson 9-6861

Cleveland Presses

help keep your plant competitive





If you do volume stamping, production-wise and cost-wise there's no better way to protect your competitive position than by prompt replacement of outmoded presses.

High stamping and maintenance costs are the penalty of inefficient press operation. Don't let them rob you of the cost of new, efficient presses.

Now's a good time to check your older press performance records. You may find that you're already paying for new presses . . . without their benefits. If so, you can make no better investment than the purchase of new Cleveland Presses equipped with the Cleveland (patented) Drum Type Clutch. Our engineers will gladly help you select the right Cleveland for your needs. Write or call today!

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Power Presses • Fabricating Tools • Punching Tools and Dies

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New Design Trends for

Harvey Aluminum Extrusions

To any experienced engineer or designer, aluminum extrusions are a common commodity. You don't have to tell him that extrusions offer such advantages as ease of fabrication, design flexibility, etc. He knows that. What he wants to know now are the newest advances made possible by the extrusion process.

tical is 25% inches. For functional, structural, or decorative applications demanding custom design plus light weight, corrosion resistance, high strength, and a naturally attractive finish, Harvey Aluminum Extrusions are first choice. And remember, Harvey is traditional for high quality and service.

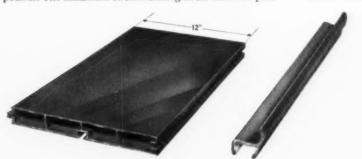
Potential for new configurations and applications

Typical new applications for Harvey Aluminum Extrusions are illustrated below. The design possibilities for aluminum extrusions are now practically limitless. Large heavy press sections; unusually complex shapes; wide, integrally stiffened skin panels; solid, hollow, and stepped extrusions; and extra long thin sections can be obtained from Harvey in all aluminum alloys. Heat-treated shapes can be produced in lengths up to 80 feet, weighing as much as 2,500 pounds. The maximum circumscribing circle diameter prac-

Harvey Aluminum leads in extrusions

Harvey's completely integrated facilities include a large complement of extrusion presses ranging in size from 1400 tons to 12,000 tons, stretch-straighteners up to 3,000,000 pounds capacity for lengths up to 105 feet, and the newest supporting and finishing equipment.

If you have a problem with extrusions, thoroughly qualified Harvey specialists are always ready to help you improve your product. Write to Harvey Aluminum Sales, Inc., Torrance, California, or contact the nearest sales office listed under "Aluminum" in your classified telephone directory.



PANEL for highway signs. Extruded aluminum shape offers maximum strength and economy. Design combines several functions within a single shape. Light weight eases erection. Aluminum's natural, attractive finish and resistance to corrosion minimizes maintenance.

AUTOMOTIVE WINDOW FRAME combines utility with natural brilliance, climinating costly plating operations. Rust is never a problem. This extruded shape typifies the trend in using aluminum for both decorative and functional applications in the automotive industry.



STRUCTURAL ASSEMBLY of extruded shapes is utilized for large span hanger and warehouse doors, building walls, and other components. Both structure and enclosure are formed by combining two aluminum extrusions. Interlocking design speeds and simplifies erection.

Making the most of aluminum . . . for everyone

HARVEY

HARVEY ALUMINUM SALES INC., TORRANCE, CALIFORNIA

Harvey is a leading independent producer of quality aluminum products in all alloys and sizes: Rod and bar, pipe, tube, hollow sections, press forgings, forging stock, impact extrusions, structurals, special shapes, extrusions, screw machine products and other aluminum products. Harvey is also producing similar items in titanium and steel.



got a problem?

If it's a *special steel* problem, let Crucible solve it for you quickly. Experienced Crucible sales engineers are always available to help with problems of selection or fabrication. And all Crucible warehouses are geared to supply the steels you need when you need them.

You can depend on Crucible — big enough to serve you, small enough to want to.

Stocks maintained of:

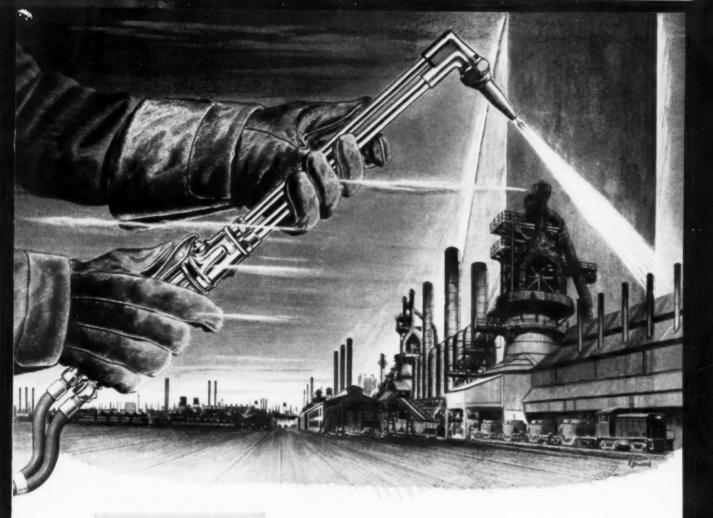
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE

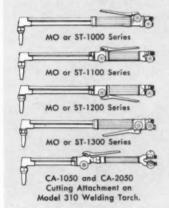
WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square. Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Harrison • Indianapolis • Los Angeles • Milwaukee • New Haven • New York
Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.



CHOICE OF LEVER POSITION



Select either Monel (MO) or forged bronze (ST) head; available in four lengths: 21", 27", 36" and 48", with 90°, 75° and 180°, 45° on ST models only. Same design features contained in cutting attachments, with forged bronze head.

OPERATORS PREFER

this torch for hot, tough jobs!

LICK YOUR HOTTEST JOBS

... solid stainless steel mixing tube absorbs heat slowly, keeps gases below flashpoint.

LAST LONGER UNDER ROUGH, TOUGH USE

... because they're made of toughest materials ... special heat resisting bronze heads, forged brass bodies.

EASIER TO HANDLE, EASIER TO MAINTAIN

... hand-fitting oval shaped grip ... well balanced for ease of handling ... practical design for ease of service after long use.

Make your tough jobs easy, your easy jobs a pleasure . . . see your Victor dealer now!

VICIOR

VICIOR EQUIPMENT COMPANY

35

Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

844 Folsom St., San Francisco 7 • 3821 Santa Fe Avenue, los Angeles 58



REPUBLIC



World's Widest Range of Standard Steels

REPUBLIC CHAIN

combats heat and abrasion torture

One of the world's toughest chain applications is its use in modern cement kilns. Here, continuous operation at temperatures up to 750°F, in a grinding slurry of crushed limestone, clay and other abrasive materials, demands the ultimate in chain strength and toughness. And, because cement manufacturing is a continuous process, maximum wearability is essential. Costly shutdowns for chain replacement must be held to a minimum.

Republic Kiln Chain, shown partially installed, on the opposite page, is fully equal to this demanding service. Combining high strength and toughness, plus extreme heat and abrasion resistance, it is available in all popular patterns made from a complete selection of materials.

Whatever your original equipment or application problem, the best first step toward a solution is to call your Republic Bolt and Chain Division Representative. He is backed by a complete selection of chain products, fittings and accessories. Types include fire welded, electric welded, and weldless; available in high carbon, low carbon, alloy and stainless steels and wrought iron. Or, for illustrated literature, mail coupon.



REPUBLIC NYLOK® FASTENERS COMBAT VIBRA-TION whether seated or not. Nylon pellet imbedded in bolt or nut forces tight metal-to-metal lock between opposite threads and mating threaded member. This locking technique also provides excellent adjustment and reusability characteristics. Nylok Bolts and Nuts eliminate extra locking devices—can be hand or power wrenched. Send coupon for further information.



REPUBLIC ELECTRO PAINTLOK® DEFIES FORMING TORTURE, as demonstrated by this multiple-bending operation required in fabricating acoustical-ceiling fastening members. The special, chemically-treated zinc surface won't crack, flake or peel off under any operation permitted by the basic steel sheet. Result is a superior final flnish. Even if scratched through, the coating limits corrosion to point of damage.



REPUBLIC HIGH STRENGTH STEEL COMBATS COR-ROSION in pleasure cruisers built by Roames Steel Boats, Division of Chris Craft Corporation. Strength and shock resistance of steel increase seaworthiness and provide maximum safety in event of collision with submerged objects. Beyond greater corrosion resistance, as compared to ordinary carbon steel, use of Republic High Strength Steel eliminates unnecessary hull weight and provides fine weldability.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION Dept. C-3174

3104 East 45th Street Cleveland 27, Ohio

Please send me more information on:

- ☐ Chain Products
- ☐ Electro Paintlok Sheets
- ☐ Nylok Fasteners
- ☐ High Strength Steel

Name....

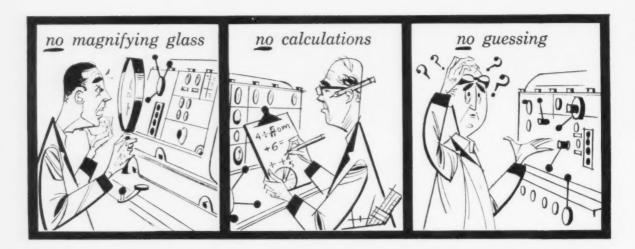
Title

Company_

Address_

Zone___State.

Know your feed... set your speed!



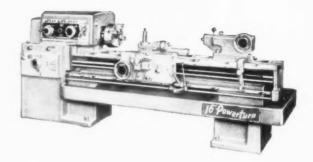
quickly...almost automatically with the LODGE & SHIPLEY POWER TURN LATHE and SPEED-DIAL HEAD!

Take "by-guess" and "by-golly" confusion out of lathe operation! Lodge & Shipley POWER-TURN Lathes with Speed-Dial Head make speed selection and setting simple as a...b...c!

- a . . . set work diameter
- b . . . read r.p.m. opposite cutting speed
- c...set levers to automatic indicator lights

This time-saving, fool-proof simplicity is but one feature of New POWERTURN Lathes. Combined with traditional Lodge & Shipley accuracy and rugged strength are many other features for new precision and new operating convenience. New literature . . . ready now . . . tells the complete story: how POWERTURN Lathes are designed to facilitate turning to higher levels of profitable operation. 13, 16 and 20-inch sizes.

The Lodge & Shipley Company, 3055 Colerain Ave., Cincinnati 25, Ohio.



Lodge & Shipley

your LODGE-ical choice!



turn Problems into profits*

Oxygen-cutting blowpipes are cutting metals of all thicknesses, faster, and more economically than ever before. From one-of-a-kind jobs in small shops, to production line and foundry operations, new high production speeds and gas efficiency have made oxygen-cutting an almost indispensable tool to modern industry.

The new Oxweld C-63 blowpipe shown above is an example of the improved products which result from Linde's constant research and development in oxygen-cutting. This manual heavy-duty blowpipe will remove even the heaviest risers quickly and smoothly.

For the answer to all your cutting needs—whatever they may be—see Linde's complete line of oxygen cutting apparatus. Start saving now, contact your local representative today.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street New York 17, N. Y.

Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto

"Oxweld" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.





HOW TO PUT HALLOWELL SHOP DESKS TO WORK IN YOUR PLANT

BUY THESE STANDARD MODELS



MODEL 406



MODEL 409



MODEL 400

OR USE INTERCHANGEABLE PARTS TO CUSTOM BUILD THESE DESKS

SINGLE DRAWER

PIGEONHOLE TOP UNIT



DESK BODY UNIT

TOP UNIT

LOWER SHELF



ADD EXTRA DRAWERS

Sturdy steel for years of use Large, smooth writing surface Drawers that glide on roller bearings, have recessed drawer pulls Built-in lock.

Green baked-on enamel finish. Stocked by leading shop equipment dealers. Ask for Bulletin 2106.

Hallowell Shop Equipment Division,

Standard Pressed Steel Co., Jenkintown 17, Pa.



- JENKINTOWN

PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING



Talide Die cuts molding cost 7¹/₄¢ to 1¢...

 Simonds Abrasive Company, a leading producer of abrasive wheels, called in a Talide Die Engineer to help reduce excessive die costs. The highly abrasive action experienced in molding the wheels to shape cut service life of hardened steel dies to 3000 wheels. A Talide carbide die having 6" I.D. was designed and, due to its super hard and dense structure, approximately 25 times the number of wheels were pressed! \$4,708.80 worth of steel dies would have been required to equal the production of this one \$690.00 Talide die. Metal Carbides Corporation, 6001 Southern Boulevard, Youngstown 12, Ohio.

Metal Carbides Corporation 107 E. Indianola Ave. Youngstown 7, Ohio ATT: Mr. R.T. Beeghly

At the request of your Mr. J.R. Macek, I am forwarding information about our molding die costs for the manufacture of grinding wheels pressed on an automatic press, facture of grinding wheels pressed on an automatic press. Dear Mr. Beeghly:

when we first began to use sutomatic presses in our process we set up with steel dies which gave us a molding to cost of \$.075 per piece produced. We then went to the cost of \$.075 which gave a per piece die cost of \$.075.

A per piece die cost of \$.015.

A per piece die cost of \$.015.

We have recently had one of these dies reworked and have noted still further increase in life and a per piece die noted still further increase in life and a per piec Needless to say, we are quite pleased with the results obtained. If we can produce further information, please let us know.

obtained. If SIMONDS APRASIVE COMPANY

William Konn Tool Engineer and wrong control where we set the control of the c

DEEP DRAW DIES

25,680,000 outlet boxes drawn with TALIDE—Steel dies average 700,000.



POWDERED METALLURGY DIES

Compacting highly abrasive chemical powders, TALIDE Pill dies last 4 months, steel dies wore out in 6 hours.

HEADING AND EXTRUSION DIES



Send for Catalog 56-G or ask for Talide Die Engineer to call



HOT PRESSED AND SINTERED CARBIDES . VACUUM METALS HEAVY METAL . ALUMINUM OXIDE . HI-TEMP. ALLOYS OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Save \$1000 per year on every Industrial Truck you use



You might even save more. Plenty of users of electric industrial trucks are doing so right now. These are realistic. average savings based on all kinds of operating conditions. If your present industrial trucks aren't electric, the chances may be that you are throwing away thousands of dollars every year.

This is something that doesn't appear on the surface. Because electric industrial trucks generally have a higher price tag-like most quality merchandise. But the real cost of any industrial trucks doesn't stop when you buy them. Over the life of a truck, the operating costs might even exceed the price.

Electric industrial trucks save in the three most important areas of cost breakdown: depreciation, fuel and repair. They generally outlast other trucks from two to four times. Instead of fuel, you buy electric powerfrom your local electric company at low rates that have been steadily declining for years. Since the electric drive system runs cool and has so few moving parts, maintenance and repair costs alone average several hundred dollars per year less. And heavy duty batteries last for years without replacement.

In addition to their tremendous economies, electric industrial trucks offer the advantages of quiet, vibration-free operation; and virtual freedom from unscheduled downtime.

These are important considerations for up-to-date management men today. Have a talk with your nearby industrial truck dealer or salesman. He's listed in your classified telephone directory under "Trucks-industrial."

This message is presented as a service to industry by Exide Industrial Division, The Electric Storage Battery Company, Phila. 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY Exide



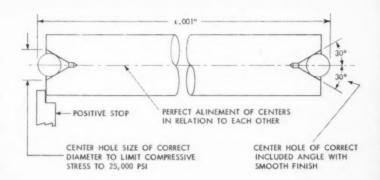
CENTERING IS CRITICAL

FOR TRACER AND AUTOMATIC LATHE PRODUCTION

The above sketch graphically highlights the centering "musts" for work to be automatically machined between centers.

Model CS Lo-swing Automatic Drilling and Centering Machine has the inbuilt features to provide all these requisites. It is designed for accurate centering on a continuous, high production basis, yet can be quickly and easily "changed-over" for short run jobs. Its 100% mechanical system provides positive, independent control of rapid traverse movements and drilling feeds. It has a fully automatic cycle and can be completely automated in a production line.

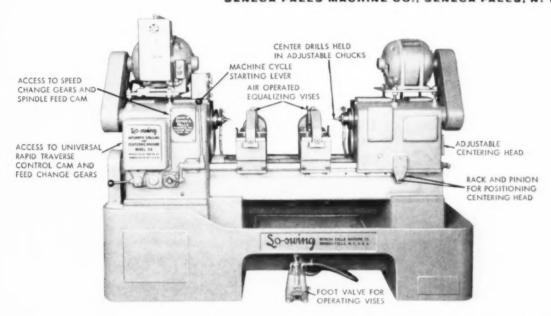
Write for your copy of Bulletin CS-54 which tells the whole story.



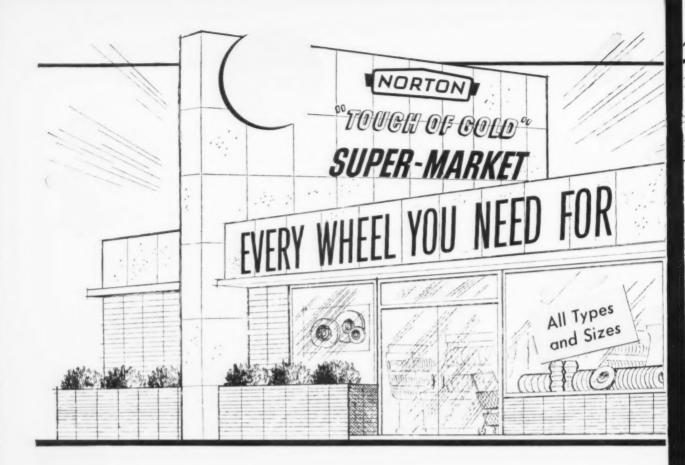
THIS IS WHAT MODEL CS WILL DO TO CUT COSTS ON TRACER AND AUTOMATIC LATHE PRODUCTION

- provide positive control of center depth to + .001".
- accurately locate work piece to assure correct center depth at both ends.
- guarantee correct angle and perfect alinement of center holes.
- produce a smooth, cleanly-finished center hole capable of positive contact with the surface of the center. This is accomplished by a unique design of the feed cam which withdraws the center drill near the end of the feed stroke to clear chips . . . and then feeds a few thousandths at reduced rate for a final finish cut.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.



So-swing model CS automatic centering machine



Let's toss a bouquet to the modern super-market — one of the greatest time and trouble savers in present-day living.

But, have you ever stopped to think that, in the abrasives field, Norton brings you real super-market convenience? Here, in the world's largest line of abrasive products, is everything you need for every grinding job.

Take tool room grinding wheels. In these, as in all other categories, the Norton line is 100% complete. You don't have to shop around — going to one source for wheels that will sharpen steel tools, to another for diamond wheels, to another for mounted wheels.

You can get them all at Norton. And they're all the best wheels that can possibly be made. The advanced equipment and broad experience you find at Norton you'll find nowhere else in abrasives manufacture.

Advantages like these mean leadership. And they result in precision-processed, precision-performing wheels that grind exactly alike — from wheel to wheel and lot to lot.

See Your Norton Distributor for wheels that will bring the value-adding, profit-boosting "Touch of Gold" to all your tool room grinding operations. Ask him for the two helpful booklets — A Handbook on Tool Room Grinding and a booklet on How To Select Wheels For Precision Grinding Tool And Constructional Steels. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. Behr-Manning Company, Troy, N. Y., a division of Norton Company. Export: Norton Behr-Manning Overseas Incorporated. For the booklets or other information write to Norton Company, Worcester 6, Mass.

TOOL ROOM GRINDING

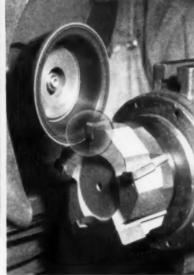
Precision-Processed

All abrasives and bonds

Precise
Duplication



FOR SHARPENING STEEL TOOLS, as well as for surface, cylindrical and internal grinding on all steels, Norton G Bond and BE Bond Wheels — in 32 ALUNDUM*, 38 ALUNDUM, 19 ALUNDUM or the new non-premium priced 44 ALUNDUM abrasive — add the moneysaving, cost-cutting "Touch of Gold." These vitrified bonds are the most efficient ever developed for precision and semi-precision grinding.



FOR CARBIDE GRINDING, Norton diamond wheels are the recognized "Crown Jewels." Made in the regular B resinoid bond for wet grinding and the B6 resinoid bond for dry grinding. For many carbide grinding jobs Norton K Bond CRYSTOLON* wheels are often the best investment.



FOR DIE AND MOLD FINISHING Norton mounted wheels bring you big savings on the widest range of tool room jobs. They're a 100% complete line, for all requirements.

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

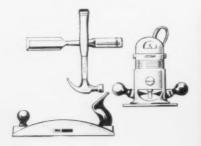


Making better products ... to make your products better

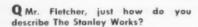
NORTON PRODUCTS: Abrasives • Grinding Wheels
Grinding Machines • Refractories
BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening
Stones • Behr-cat Tapes

W-1763

"...the news and information



In New Britain, Conn., we recently had the pleasant experience of talking with Gerald M. Fletcher, Director of Advertising for The Stanley Works and an outstanding industrial advertising man. Mr. Fletcher joined the Stanley organization shortly after graduating from Bates College in 1925. Ever since 1933, he has been responsible for the direction and coordination of the company's extensive advertising activities. Among other things, we discussed the importance of trade and industrial publications and his use of them. Here are the highlights of the interview:



A The Stanley Works is made up of 13 major divisions and subsidiary companies. We are the manufacturers of a wide variety of products, including hand and portable electric tools, hardware, cold rolled strip steel, steel strapping, springs, metal stampings, industrial coatings, aluminum jalousies and awnings, drapery hardware, and wood specialties.

Q How old is The Stanley Works?

A It was started 115 years ago in 1842.

Q Here in New Britain?

A Yes. At first we manufactured hinges, bolts and wrought iron hardware. Later we added hot and cold rolled strip steel. Then we added chemicals. And so on.

Q When did advertising first come into the picture?

A Just about 70 years ago.

Q And your early advertising appeared in the trade press?

A Exclusively. It wasn't until much later that we undertook a consumer program.



Q Do your campaigns in trade and industrial publications still account for a major part of your advertising effort?

A They certainly do. Offhand Pd say they account for more than 50% of our total advertising investment. Here at Stanley we have a firm belief that unless the trade and industrial field is covered completely, all other advertising activities are much less effective.

Q How many trade and industrial publications do you now use?

A Approximately 115.

Q What is your basic philosophy with regard to space advertising?

A Well, we believe that space advertising, as well as all other forms of advertising, must prove its worth. In other words, the money we spend must show evidence of return. In this respect I am sure we are no different than most other big advertisers. We all want to be absolutely certain not only that our advertising is well written and well illustrated, but also that it appears where it assures results—in publications where it is seen and read by customers and prospects.

Q Previously you said something about your belief that no advertising could be truly successful if the trade field is not covered. This, too, is a part of your philosophy, is it not?

A It is. We firmly believe that the groundwork for any successful sales program must begin at the wholesale level, The man who is going to sell your product, whether a hardware dealer or the wholesaler, must be presold on it. Unless he is, any job done at the consumer level can't be as productive as it should be,

Q And what is the basic objective of your advertising?

A We expect the advertising to approach the effectiveness of the salesmen. To present merchandising plans. To do missionary work. To get across to every level in distribution the realization that we know that our success is based on their selling the product with ease and profit. We expect the advertising not only to sell Stanley quality, but also to sell our conviction of a responsibility to our customers. We expect the advertising to make the work of the salesmen more effective.

they must have to succeed"





Q I imagine that with the high cost of the average sales call today, your latter point is mighty important.

A Indeed it is. I believe that it is quite possible to demonstrate that management can no longer afford not to use the trade press in close support of the sales force.

Q Do your salesmen recognize the value of the support they get from advertising?

A Yes they do, and there is a very good reason why they do. Our advertising programs are the programs of our sales managers. All advertising we undertake has been worked out with our sales management and has its endorsement. After all, our one reason for advertising is to help promote sales, to help the salesman do a more effective and efficient job, and it is quite obvious to us that any advertising we do must be in complete accord with the objectives of the people responsible for making sales.

Q Does each of your divisions or subsidiary companies have an advertising organization?

A They do not have independent advertising organizations. However, each division has its own advertising manager or supervisor who is a member of The Stanley Works Advertising Staff. Our efforts are unified to insure that the advertising of each division not only does the best possible job for that division, but also adds its impact to all other Stanley advertising.

Q How do you arrive at the advertising budgets for your divisions?

A We use the "task" method. Working closely with the division sales manager, we first decide on the job to be done. Next we determine how and where it can be done, and, finally, using facts,

figures, experience and judgment, we figure up the cost and ask for budget approval.

Q What are your thoughts with regard to the importance of today's trade and industrial publications?

A I believe I have already indicated their importance to our program. We have used them for many years, and we are using them in increasing numbers. We feel that they serve a unique function, for they enable us to tell our customers and prospects about Stanley products under ideal circumstances—when they are actually looking for the things we have to say and sell.

Q Do you believe that the importance of the trade press is increasing?

A Very definitely. I think the reason can be found in just one word—authoritativeness. Today's leading trade and industrial publications are authorities in their fields, because they are staffed by people whose training and interests qualify them as such. Their editors and writers have firsthand knowledge of the fields they serve. Men in any trade, industry or profession determined to move ahead know very well that in the pages of their trade press they can get the news and information they must have to succeed.

Through the use of trade and industrial publications you are able to communicate with your customers and prospective customers in an atmosphere that is natural to them and most productive for you. In this respect, today's reliable business press serves a purpose unduplicated by any other selling force.

Chilton publications cover their chosen fields with an editorial excellence and a strict control of circulation that assure confidence on the part of readers and advertisers. With such acceptance goes a proportionate selling power.

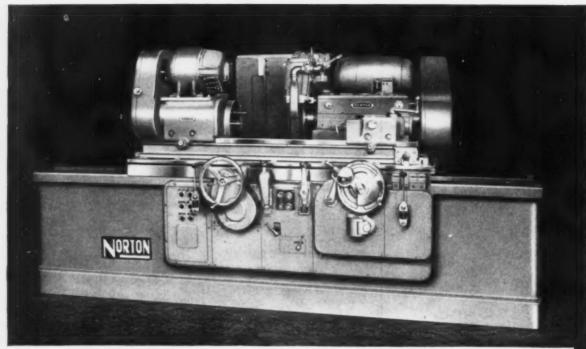


Chilton

Chestnut and 56th Streets . Philadelphia 39, Pennsylvania



CHILTON PUBLICATIONS: Department Store Economist • Hardware Age The Iron Age • Jewelers' Gircular-Keystone • Distribution Age • Motor Age Automotive Industries • Optical Journal and Review of Optometry • Spectator Commercial Car Journal • Boot and Shoe Recorder • Hardware World Gas • Electronic Industries • Butane-Propane News • Book Division



A NORTON TYPE CTU SEMIAUTOMATIC CYLINDRICAL GRINDER. The fastest, most economical and versatile grinding machine of its type. One-lever control of the automatic grinding cycle reduces the operator's duties to loading and unloading. Both the 6" and 10" Type CTU's are available as semiautomatics or as plain machines.

Norton Type CTU Cylindrical Grinders

are packed with features for...



Production line and job shop users report that Norton 6" and 10" Type CTU cylindrical grinders have doubled and tripled production, replaced several machines and climinated costly extra operations.

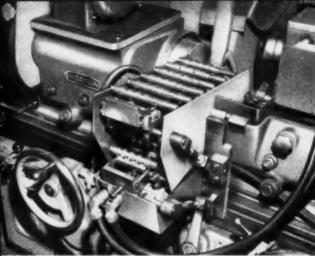
That's because of the many time-and-work-saving "Touch of Gold" features — standard and auxiliary — available with these grinders.

Some of the expertly automated auxiliary features are

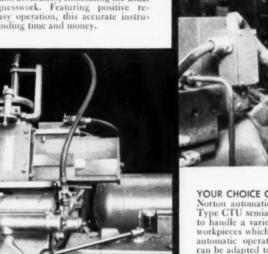
described here. Check them carefully — and figure their value to your own cylindrical grinding operations. And remember: only Norton offers you such long experience in both grinding machines and wheels to bring you the "Touch of Gold" that helps you produce more at lower cost. For further facts, see your Norton Representative, or write to Norton Company. Machine Division, Worcester 6, Mass. In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5.



THE SWIVALIGN* ELIMINATES CUT-AND-TRY. Another Norton "Touch of Gold" development for faster, better, lower cost grinding. The swivalion Dual Electric Indicator, available for Norton cylindrical and universal grinders, enables operators to adjust the angular positions of swivel tables quickly and accurately, climinating the usual cut-and-try guesswork. Featuring positive response and easy operation, this accurate instrument saves grinding time and money.



RAIL TYPE



NORTON

WHEEL HEAD MOUNTED AUTOMATIC TRUING OFFERS BIG ADVANTAGES. A Norton automatic truing device, as shown here on a Type CTU grinder, quickly repays its original cost. It speeds up production, increases wheel life and increases diamond life. Also, it decreases the skill and effort required with hand truing. Operation is extremely simple. Once the original settings are made, all you do is push a button. Then the diamond automatically makes its round trip across the wheel face, at pre-determined speed and feed. Easy adjustments assure correct settings for each job . . . Another step forward in automatic grinding!



TURRET TYPE

YOUR CHOICE OF AUTOMATIC LOADING DEVICES. Two types of Norton automatic loading devices are obtainable with 6" and 10" Type CTU semiautomatic grinders. The rail type loader is designed to handle a variety of small shafts. The turret type loader handles workpieces which must be chucked. Thanks to their steadily paced, automatic operation these Norton-developed loading mechanisms can be adapted to full automation. Or, they make it possible for one operator to tend a battery of machines, speeding production and cutting unit costs day after day.



GRINDERS and LAPPERS

Making better products . . . to make your products better

District Offices: Worcester • Hartford • New York Area, Teterboro, New Jersey • Cleveland • Chicago • Detroit

*SWIVALIGN — Norton trade name for Dual Electric Indicator for accurate measurements of swivel table adjustment.

Inland Ledloy... the original leaded steels

It is not by chance that Inland Ledloy steels have set the standards with which all other free machining steels are compared. Almost twenty years have passed since Inland started a metal-working revolution with its discovery of how to add lead to steel... years in which Inland has refined and developed its techniques and gained the practical daily production experience that has made Inland world leader in the production of fine leaded steels.



Here, two members of Inland's experimental production team are literally helping to make steel history—producing the world's first heat of leaded steel in a standard open hearth furnace. Even after the addition of lead to steel had been mastered in laboratory-sized furnaces, many months of experimentation were required to learn how to translate this "test tube" experience into commercial production.

Inland's research and production men learned the secrets of making Ledloy the hard way. But this has given to Inland the kind of experience in the making of leaded steels that is unequaled and has made Ledloy steels the world's most machinable.

Experience makes Inland Ledloy better

INLAND LEDLOY is sold in cold drawn form, under various trade names, by leading cold drawers and steel warehouses from coast to coast.

INLAND STEEL COMPANY 38 South Dearborn Street • Chicago, Illinois Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York • *registered trade name of Inland Steel Company, pioneer in the development of leaded steels.



Speed where it counts... 60% faster material removal!

Improved Black & Decker 7" Sander-Grinder is POWER-BUILT to work harder, longer, faster!

Tests show improved B&D 7" Heavy-Duty Sander-Grinder maintains greater speed under maximum load for 60% faster material removal than competitive tools. B&D Sander-Grinder also runs cooler, allowing longer continuous operation. Speeds up sanding, grinding, cutting, brushing equally well

with proper attachments. Smooths welds, removes rivets, cuts off studs fast. Removes paint, rust and scale from tanks and boilers.

Perfect overall balance and lightweight assure less operator fatigue. Blower directs exhaust air away from operator. Comes complete with regular pad and Kool-flex pads. Call your distributor for a free demonstration. Or write for free catalog to: The Black & Decker Mfg. Co., Dept 7803, Towson 4, Md. (In Canada: 80-86 Fleet St., E., Toronto 2, Ont.)



Loak Under TOOIS ELECTRIC in Yellow Pages

Leading Distributors Everywhere Sell



Exclusive Power Output! Specially-built B&D universal motor guarantees continuous power, 90% more than previous models.

EXCLUSIVE MOTOR PROTECTION!
New Thermaleze wiring (for motor winding) minimizes problem of overloading, protects motor from overheating, stalling.

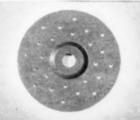
Exclusive Long-Life Brushes! New "twin-contact" brush design improves overall tool operation. Increases brush life by at least 50%.

EXCLUSIVE KOOL-FLEX PAD! Perforated to make sanding discs run cooler. Less chance of burning material. Gives better tool balance.









DAYSTROM

Electric Corp.

- puts it on a

RIVETT!



from 4140 steel after tempering at a Rockwell hardness of

C 20-25.

Productivity!

Brass piece with off-center counterbore and through-

hale completely machined on a 1020S Rivett.

Daystrom machines model parts with an eye to normal manufacturing methods. For this reason Daystrom highlights an important Rivett feature — productivity — in its statement:

"We have found that the Rivett 1020S Lathe is one of the most useful and all around productive machines in our model shop,

Inquire about the 1020 Toolroom Precision Lathe now. Write for 16-page catalog and the name of your nearest dealer. and is so constructed that it is easy for an average operator to obtain the dimensions and finish necessary in our work."

"Model work requires holding concentricity to .001" T.I.R. between several diameters; turning is often held to several tenths. And, a finish of 32 micro inches and better is quite easily obtained!"

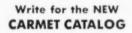
RIVETT LATHE & GRINDER, INC.

Dept. IA 3, Brighton 35, Boston, Mass.











... Completely revised, the 16th Edition of the Carmet Catalog contains the latest information on all Carmet grades, and on Carmet blanks, tools, die sections, etc., also gives details on special preforming and how to order special parts.

Address Dept. A-87

A leading West Coast manufacturer now uses Carmet CA-610 tool blanks for machining components of jet engines and gas turbines. Since switching to this special steel-cutting carbide grade, production has sharply increased from 28 parts per blank to more than 80.

Carmet throw-away blanks are designed for any type of tool holder. This same manufacturer reports that the ease and speed with which used blanks may be exchanged for new ones has reduced downtime for tool change-over by 7%.

Advantages such as these are important in your industry, too. Call your Carmet dealer TODAY for his advice on any production problems you may have . . . or write Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Mich.

For ALL your CARBIDE needs, call

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Users Say



BELTS AND HOSE



It's Poly-V°... and Trouble-Free!

Major causes of drive trouble have been engineered out of R/M's patented, new Poly-V Drive. Because it employs a single, endless V-ribbed belt running on sheaves specially designed to mate precisely with the belt ribs, Poly-V delivers more power per inch of drive width than ever before possible! R/M Poly-V delivers up to 50% more power than an ordinary V-belt drive of equal width . . . equal power in as little as $\frac{2}{3}$ the width. This means narrower sheaves . . . less shaft overhang . . . less drive weight on heavy duty power driven equipment.

R/M Poly-V's single unit belt design also

eliminates "length matching" problems and downtime for belt replacements. Poly-V belt speed ratio and belt position remain constant from no load to full load to run smoother and cooler — with *less wear* on belt *and* sheaves! Just two cross sections of Poly-V belt meet *every* heavy duty power requirement: belt and sheave inventories are cut to a new low!

An R/M representative will show you other features of Poly-V* Drive that add up to longer, trouble free service for every heavy duty power drive application.

Write for Bulletin #6638

And . . . for the "Smoothest Running V-Belts Made" Specify R/M CONDOR and SUPER-POWER V-BELTS

Give You "More Use per Dollar"

Allflex Hose—Light, Strong, "Flexible as a Rope"!

This new R/M hose offers a degree of rugged strength with light weight and flexibility not possible with ordinary all-purpose constructions. All-flex hose coils and uncoils freely in any direction... without kinking. Uniform inside and outside diameters permit faster, easier, safer coupling. You can't find a longer lasting, easier handling hose for use with air, water, oil and gases—even mild chemicals!



R/M makes a complete line of quality hose for special services, too. Whatever your requirements, you get more use per *hose* dollar from R/M.

Write for Bulletin #7075



R/M Puts the "Extras" in Conveyor Belt Design!

For the conveyor belt engineered for your particular job, investigate R/M's advanced developments in heavy duty belt design . . . constructions like extra flexible Ray-Man . . . which trains naturally, troughs easily . . . handles fuller, heavier loads even where small pulleys are required in low-head room installations . . . extra-cushioned Homocord, for unusually abusive shock loading . . . R/M Tension-Master for extra long lifts and high tensions. Each belt is mildew-proof and moisture resistant . . . and each is protected by the exclusive "XDC" Cover, R/M's bonus extra to greatly increase resistance to wear, tear, cuts and abrasion. Specify R/M Conveyor Belts . . . you get "More Use per Dollar."

Write for Conveyor Belt Bulletins

RM 715

BELTS . HOSE . ROLL COVERING . TANK LININGS . INDUSTRIAL RUBBER SPECIALTIES

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls







FAMOUS MASTER LAMINATED **PADLOCKS**

Multiple steel plates . . . stronger than a solid block! Genuine brosscylinder, pin-tumbler security. No finer padlock protection!



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STOCK ROOMS





POWER PLANTS



Write for FREE Catalog of complete Master line .

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Master Lock Company. Milwaukee 45, Wis. World's Largest Padlock Manufacturers





STAINLESS STEEL COMBINATION PADLOCKS

Double-wall construction . . . 3 number brass locking mechanism. Available with "Key-Control" - one control key opens all locks.

Master's complete line offers you the world's finest padlock security ... for every protection need!

Here are just a few of the Master features and services that make your protection problems easier:

- Special long or short shackle styles.
- Steel or brass cases.
- Quick delivery on keyed alike or master-keyed sets.
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Available from your Industrial Supply or Hardware wholesaler.





AUTOMATED **Tube Bending**



WITH HILL ADVANCED-DESIGN MACHINES

If you bend ferrous or non-ferrous tubing, you can make significant cost savings by installing new Hill advanced-design, automated bending equipment. These machines are operating successfully and achieving startling cost reduction in metalworking plants throughout the world.

Hill automatic and semi-automatic, hydraulicpowered, specialized bending machines provide consistant high production rates; smooth accurate bends; maximum safety, minimum down time and minimum maintenance

Whether you bend 50 or 50,000 pieces a day, it will pay you to investigate Hill advanced designs.

Send part specifications and production requirements for prompt quotations on cost-saving equip-



Write for this catalog giving complete information on Hill specialized hydraulic bend-ing machines, double-end machines and extrusion equipment.



ER P. HILL, INC.

22183 Telegraph Road . Detroit 19, Michigan



Here's why TRICLENE D is used for fast, thorough vapor degreasing

These statements represent the kind of degreasing results you can expect from "Triclene" D trichlorethylene. Manufacturers of products as different as automotive accessories, sporting goods, refrigerators, locks and builders' hardware—all users of "Triclene" D—made these comments,

They use it to clean grease and oil from all types of metals with every degree of surface polish. Users note that time between cleanouts is extended, and cleanouts are far easier. "Triclene" D maintains brighter cleaning—distillation after distillation—job after job.

Heat, light, air, acids and aluminum chloride will not affect "Triclene" D with its locked-in stabilizers. "Triclene" D trichlorethylene retains its original purity longer—contains nothing to harm even the most carefully machined surfaces. Yet it costs no more than other degreasing solvents!

Get all the facts on vapor degreasing. Du Pont's new book contains forty-two pages of data and illustrations on the latest metal-cleaning developments. Send for your copy—without

obligation—today.

TRICL	ENE	D
	DRETHYLENE	



BETTER THINGS FOR BETTER LIVING

E. I. du Pont de Nemo Electrochemicals Depa Wilmington 98, Delaw	rtment IA-3	- TRICLENE D
Please send me a co	py of your new vapor-	degreasing booklet.
Please have your R	epresentative phone fo	r an appointment.
Please have your Ro	epresentative phone fo	r an appointment. Title
	epresentative phone fo	
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How

Morgan "points the way"

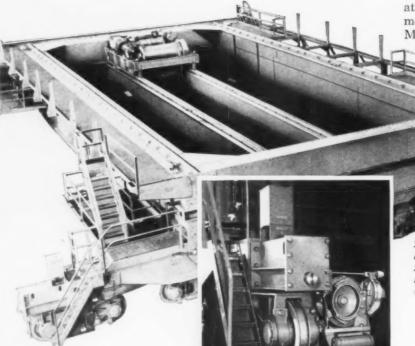
to smoother

crane operation

• INDIVIDUAL MOTOR DRIVES were pioneered by The Morgan Engineering Company to improve crane bridge travel... to provide smoother operation, to reduce the number of moving parts, to simplify maintenance, to eliminate dead weight of drive shafts, to streamline the crane.

These individual motor drives are <u>another</u> vital link in the chain of features that make Morgan cranes the best in the business.

Performance records prove that advanced design and heavy-duty construction of Morgan cranes make them less costly to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!



Six individual motor drives power the bridge of this 350-ton, 4-girder, 24-wheel Morgan ladle crane. Squaring shafts are eliminated; walkway width is minimized.



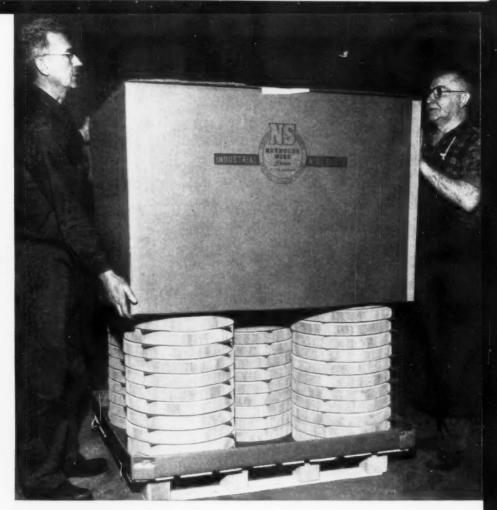
The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, charging machines, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

MORGAN

ENGINEERING CO. Alliance, Ohio







How **REYNOLDS** packs new savings into wire cloth shipments

• Palletized packaging for wire cloth, successfully developed by the Reynolds Wire Division of National-Standard, is now saving customers plenty of time and dollars.

Note in the photographs how rolls of slit and full width material are both mounted on nonreturnable pallets. Advantages and savings accrue all along the way.

For example, there's far less chance of damage

in shipment. And think how much faster, easier, these unit loads can be handled on arrival... in and out of storage... and right to production operations.

So chalk up another extra for Reynolds' service ... and find out what this new packaging method can mean to you! Find out, too, what Reynolds means by quality control and uniformity in wire cloth manufacture. It pays.

NATIONAL



STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Migh.; lire wire, stainless, music spring and plated wires - WORCESTER WIRE WORKS, Wordester, Mass.; high and low carbon specially wires
WAGNER LITHO MACHINERY, Secaucus, N. J.; metal decorating equipment - ATHEMIA STEEL, Cliffon, N. J.; fiel, high carbon spring steels - REYNOLDS WIRE, Dixon, 181; industrial wire cloth

ONE-TON TEST proves physical strength of

"Integrated" field coils

ALLIS-CHALMERS MOTORS

It's not likely a field coil of a motor would ever be punished this way. But tests like this illustrate the inherent ability of Allis-Chalmers "INTEGRATED" FIELD COILS to withstand the stresses created by the most severe loading conditions of a motor.

Available only on Allis-Chalmers Motors

"Integrated" field coils, available only on Allis-Chalmers motors, are enveloped in oriented glass fibers and heat-stabilized resins. These are securely locked to poles to resist mechanical force. High dimensional stability and tensile strength characteristics assure long life under the toughest of operating conditions. Coils are surface sealed against atmospheric contaminants. In addition, the coefficient of expansion of insulation is similar to that of copper. Heat transfer qualities are excellent. "Integrated" coil structures can withstand the most severe thermal cycling found in normal operation.

Exclusive Allis-Chalmers

"Double-protection," combining new "Integrated" field coils with Silco-Flex all-silicone stator coil insulation, is available for rotating and stationary elements of large ac or dc machines with operating temperatures through Class B range.

> For the whole story of Allis-Chalmers motors, contact your local A-C representative or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS



Heat's on Office Workers

Metalworking companies around Pittsburgh report increased union activity aimed at organizing office workers. Already-mixed areas appear to be getting first attention. One industrial relations man says pressure's strongest where plant locations place non-union people in the minority both at work and in the community, making them fair game.

Still Some Tight Areas

Don't be lulled by frequent reports of availability of flat-rolled steel products. While cold-rolled is generally in easy supply and available for quick delivery, your local mill may still be working off carryover orders of hot-rolled sheet. One midwestern mill reports it may not be able to cut its hot-rolled sheet carryover before May at the earliest.

Atom Ships First?

Propulsion plants for large ships—particularly supertankers — may nose out electric power generation as the first commercially-profitable application for nuclear power. Scientists figure they can develop an atomic-fueled supertanker (65,000 deadweight tons or more) within about three years, with a cost-per-ton-mile as low or lower than for diesel or steam. Government crash program, they add, could cut time.

New Smelting Process

Now in prototype production, a new smelting process promises to make it commercially worthwhile to extract metals from byproducts and residues of other recovery processes. Its developers feel they'll make money smelting (1) low grade Canadian iron ores assaying at 18-22 pct, (2) 11 pct manganese ore, and, (3) red mud residues of Bayer Alumina process.

Trepanning Tip

Trepanning, when it works right, is a terrifically high-speed hole-maker. Moreover, it yields a bonus: A usable core of solid material instead of virtually worthless chips. Expect a breakthrough one of these days on what is prob-

ably trepanning's biggest problem, getting enough coolant into the hollow tool bar to literally "float" the heavy core formed.

Holds "Hot" Uranium

Atomic scientists may have an answer to the problem of storing radioactive uranium in a new tantalum monoboride. Painting a film of boron onto a tantalum container, then heating briefly at 1400°C, forms tantalum diboride (TaB₂). Further heating at 1900° produces the desired TaB. The crucible holds molten uranium for several days with negligible corrosion, AEC says.

Fast Tax For Aircraft?

Commerce Dept. hopes to get the tax write-off goal for commercial aircraft reopened and enlarged to take in a "large number" of jet transports. Office of Defense Mobilization will decide this one. Aircraft built under the expansion goal would be available to the government in emergency, mostly for military use.

Stellite-Lined Gun Barrels

Army will issue a newly-adopted lightweight machine gun, with a chrome-plated, stellite-lined barrel, starting in 1959. The air-cooled, 7.62 mm weapon weights 23 lb with bipod; fires 600 rounds per minute; will replace three .30 calibre machine guns now used by Army.

Air Suspension or Springs?

With the adoption of air suspension on Cadillac's Brougham, other automobile makers are considering its use. Relative merits as against conventional springs are being weighed. Air suspension's thought to be more costly and engineers disagree on whether it is any better.

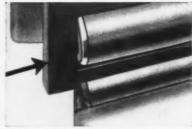
Make Cores Faster

A midwestern foundry finds cores made with a new dextrose core-binder bake through in 40 to 50 pct less time than with conventional core oils. Because cores move through ovens faster, production scheduling's more flexible. Company reports no troubles with cracking of cores, metal penetration; will adopt the material for all cores.

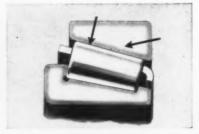
Get all these advantages... specify TIMKEN tapered roller bearings



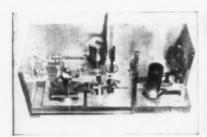
THERE ARE 27 TYPES of Timken[®] tapered roller bearings. This wide selection means you get the bearing design exactly suited to your job. Whatever your bearing application problem, we can help solve it.



THE SOFT STEEL CAGE used in Timken tapered roller bearings separates the rollers, keeping them spaced evenly. This prevents scuffing of the rollers, adds to the bearing life and gives you more for your money.



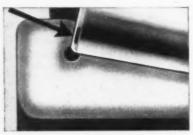
HARD ON THE OUTSIDE, tough on the inside. To take shock loads, give longer life, Timken bearing rollers and races are case-carburized to have a hard, wear-resistant surface over a tough, shock-resistant core.



MICRO-INCH FINISH is standard for Timken bearings. This profilograph checks contours and smoothness of circular surfaces to a millionth of an inch, helps us make Timken bearings truer, quieter, longer-wearing.



6,525 SIZES, the world's largest selection of tapered roller bearings. From bearings smaller than your finger to 71½" in inside diameter, the Timken Company can supply the size you need for any specific application.



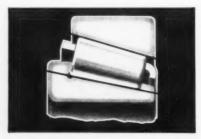
POSITIVE ROLLER ALIGNMENT is assured because the taper in Timken bearings holds ends of rollers snug against the rib. The taper in Timken bearings lets them take radial or thrust loads or any combination.



ACCURATE TO 50 MILLIONTHS of an inch. This Universal Measuring Machine checks gages and machine parts used to make Timken bearings. Our gage laboratory, one of the world's best equipped, helps make Timken tapered roller bearings your No.1 bearing value.



ONLY FINEST ALLOY STEEL is used in Timken bearings. This spectrometer helps control its quality—in 40 seconds gives the exact chemical analysis of a melt. In a few minutes, results are flashed to the melter. It's another step in rigid quality control.

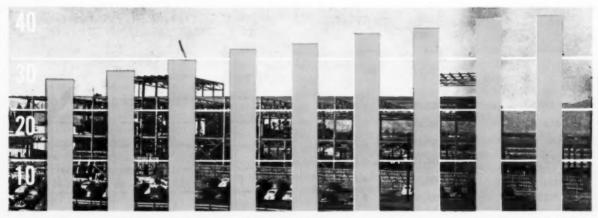


FULL LINE OF CONTACT between Timken bearings' rollers and races gives them extra load-carrying capacity. To get all these advantages, specify "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TAPERED ROLLER BEARINGS ROLL THE LOAD

Expenditures for New Plants and Equipment In Billions of Dollars— Seasonally Adjusted at Annual Rates



J-M A-J J-S O-D,55 J-M A-J J-S O-D,56 J-M,57

Is Capital Goods Boom Leveling?

Jan.-March 1957—Planned Source: Dept. of Commerce

Industry Eases Up On Capital Spending Throttle

But It's a Stretchout-Not a Letdown

Spending for new plants and equipment has played a major part in maintaining the business boom.

Easing markets of some products have led to speculation that business is less optimistic.

Here are some results of industry's re-evaluation of its expansion programs.

 Industry is taking a second look at its plans for expansion and capital improvements.

Alert to changing market, fiscal and world conditions, business is reappraising its short- and long-range programs of spending for new plants and equipment. Check and Recheck — It has weighed its market projections against new patterns of consumer spending. Higher costs of construction and tools are balanced against continuously climbing labor costs. A tight money market is measured against the prospect of higher costs in the years ahead.

The result, after all these deliberations: No letup overall in capital spending plans for industry. The current record rate of spending for new plants and equipment will hold at its present level of about \$37 billion.

There are modifications, of course, but few radical changes in spending plans are in the works.

Outward signs of this second look are seen in several forms. There will



be significant shifting of emphasis in type of spending in some industries. And some programs will be stretched out. There will be an occasional highly publicized deferment of a major project.

Take It Easy—There will be less frantic pushing for completion of facilities. The business of construction

Industrial Construction Backlogs Climb

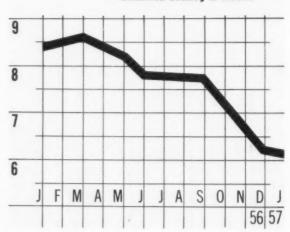
Heavy Industrial Construction Backlogs in Thousands of Dollars

	1957	1956	
TOTAL U. S.	\$16,139,231	\$14,302,163	
NEW ENGLAND	453,976	359,976	
MIDDLE ATLANTIC	2,682,229	1,807,611	
SOUTH	3,194,815	2,711,131	
MIDDLE WEST	3,656,417	3,656,122	
WEST	4,400,702	4,583,617	
FAR WEST	1,751,092	1,183,716	

Source: Engineering News-Record

But Machine Tool Backlogs Slip

Estimated Backlog in Months



Source: N.M.T.B.A.

and getting into operation is moving in a more orderly, and economical, fashion.

But there will be few outright cancellations of any significance among the major industries.

These conclusions should not be surprising. Industry has generally confirmed its intentions to go through with its plans. Nevertheless, some signals of leveling have been interpreted as signs of serious things to come.

Inside Story—To get the real story on industry's plans, IRON AGE editors went beyond official company announcements, checked officials on both sides of the expansion and equipment buying picture.

They found executives more cautious than six months ago, but still convinced that the need for capital improvements is unchanged.

Says D. W. Neville, vice president, F. H. McGraw & Co., industrial construction firm:

"Our surveys show that industry is holding to present expansion plans and is considering additional expansion. We cannot see any letdown at the moment among our clients."

Another construction authority conceded some deferments in expansion plans.

"These hold-backs are only temporary, with the projects tabled momentarily. The companies are taking a second look at their plans," he points out.

Still Needed—"They need the expansion; they need modernization; no doubt they will go through with their plans. But today they are rechecking their figures, their costs, labor, and markets. When they announced their plans they thought they knew exactly what it was worth to them. Now they want to re-evaluate."

Why all the new emphasis on new plants and equipment? It appears that economists are just discovering this side of the economy.

You only have to look back to 1956 to see why. For the first time in years the nation boomed to a record business level—without the automotive industry leading the way. This gap was made up for, and more, by the tremendous surge in industrial expansion.

Scare Talk—Today, any threat of a lapse in business spending brings out the pessimists. Many of them until recently never checked machine tool orders or backlogs of industrial construction.

A swing around the major industrial areas showed little to fear. The few deferments of plans or lengthening of programs may actually have a beneficial effect. Instead of pre-

cipitating a decline, they may help to extend the high plateau of today into 1958 and beyond.

Steel's Plans—The steel industry, by and large, is going through with its plans. Almost every company has confirmed its intention to maintain its announced rate of spending. At least one producer, while continuing with its current program, is actively seeking financing to launch an additional program.

Something to remember about steel's spending plans: Not all of it is going into increased capacity. Much of it is aimed at rounding out and balancing its products, adding to capacity of extremely tight products, replacing old facilities with modern, efficient equipment.

These plans don't change with a slight easing of flat-rolled products. However, there is some unannounced stretching out of programs here and there, probably based on an easing market.

Shifting Position—In other industries, the second look at the future resulted in a shifting of emphasis. Westinghouse Electric Corp., for example, has established expansion priorities, based on market needs. This may mean some juggling of projects, but the company will still spend \$75 million for expansion this

year and add one million sq ft of production area.

In some industries the need to modernize and improve manufacturing methods is more important than increased capacity. In the auto industry, for example, a built-in productivity factor in wages forces improved productivity in its plants. This carries over into many segments of industry.

That is one reason why machine tool builders are not concerned over a recent slump in new orders. New developments in machine tools literally force mass production industries to take advantage of them. There is no serious letup indicated in machine tool purchases.

Big Spenders—Also in the auto industry, two major deferments by General Motors have raised a lot of eyebrows. But major stockholders and many in GM's top ranks had always thought GM's plans too extensive. Nevertheless, GM will still spend \$700 million for capital improvements in this year. Ford will spend \$710 million, Chrysler between \$125 and \$137 million.

A sensitive point in expansion is aluminum, where a previous chronic shortage is suddenly eased. Aluminum companies are all going through with their plans.

Harvey Aluminum Co. continues to push its \$65 million primary aluminum plant at The Dalles, Ore.

F. H. McGraw's largest single contract is with Olin Revere Metals Corp. and Olin Mathieson Chemical Corp. for aluminum facilities.

Less Frantic — Alcoa confirms that there have been no cutbacks. But one thing is changed. Alcoa is not pushing new projects as hard as in times of shortage. The new Indiana smelter was due to be finished late this year. Now completion is set for the spring of 1958.

This does not mean that construction is being abnormally retarded. In the past Alcoa would have crews working overtime. It would not have held up operations for lack of a portion of new facilities.

Backlogs Grow—There are encouraging signs from industries that might be expected to be worried about their markets. Borg-Warner, Midwest appliance and auto parts maker, is going to spend \$26 million in 1957, slightly less than in 1956.

Reprints are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



MORE PRODUCTION: There is some tendency on the part of automotive companies to stretch out their expansion plans. But most of the planned expansion, like this giant Chrysler stamping plant, is going ahead.

GE Spending Program Cut "Slightly"

General Electric Corp. will cut back its 1957 expansion "slightly" from its record 1956 expenditure of \$205 million.

This is not due to any slowdown in business, says Ralph J. Cordiner, GE president. Rather, the company believes that inflationary pressures would be encouraged by a continued growth at the 1956 rate.

Total Increased — GE originally planned to spend \$500 million on expansion between 1956 and 1958. This figure has now been increased, even though the 1957 rate will be slightly under a year ago.

Mr. Cordiner did not state the precise 1957 figure other than it will be only slightly under the rate for 1956.

The large manufacturer of electrical equipment and appliances grossed \$4,090,000,000 in 1956. January and February shipments are now exceeding the rate of a year ago and new orders are also running ahead of the 1956 rate.

Mr. Cordiner reports that GE's total volume of business has doubled in the past eight years, predicts it will double again in the next eight.

Cutbacks Exaggerated—Statements by Mr. Cordiner indicate that previous reports of GE's cutbacks in expansion have been overemphasized. Four of GE's departments were previously reported as having to cancel expansion plans.

Between 1931 and 1939, GE averaged \$8 million a year for new plants and equipment. By 1953 the figure had gone to \$140 million per year. This rate was repeated in 1954, jumped to \$150 million in 1955, hit \$205 million in 1956.

Sperry Rand to Bristol

Sperry Rand Corp., New York, will build a 150,000 sq ft plant near Bristol, Tenn. The plant will make naval ordnance systems, air navigation equipment and missile system equipment. Employment of approximately 1200 is expected.

How to Cut Castings Costs

Start Out With the Correct Design

It may come as a surprise, but many designers don't know the fundamentals of correct castings design.

Pittsburgh foundry course is part of an educational program.

Survey shows many mistaken ideas about aging, strength and thermal qualities.

 New light illuminated an old subject recently when a Pittsburgh foundry gave a rundown on the do's and don'ts of designing iron castings.

Rosedale Foundry (Meehanite) showed several hundred attentive engineers how correct design could save money and improve casting quality. They were told how improved design cut the weight of a single casting by 11,000 lb, reduced costs 12 cents a pound on a volume job, saved \$1000 by eliminating machining of two pieces.

Need Information - After the

session, many designers confessed it was all news to them. They had muddled along for years without precise information on shrinkage rates, hot spots and tensile strengths.

Their situation is not unique. Although castings go back nearly to the time of the first wheel, engineers still work with big blind spots when they deal with foundries. In a recent survey of 1500 technical people, Gray Iron Founders Society found that more than half had mistaken notions a bout aging, strength and thermal qualities.

What's Wanted—Three quarters of those replying saw a need for more data on castings. Nearly half rated design dope as the biggest need.

To correct this situation, foundries have stepped up organized educational efforts. At the Rosedale session, representatives of the Meehanite Metal Corp. explained the metallurgical considerations in casting design:

Metal shrinks as it solidifies. Design should avoid trapping molten metal within areas that have solidified more rapidly. Trapped molten areas, or hot spots, result in voids when the metal hardens and shrinks.

Fundamental Rules—In general, this condition is avoided by equalizing the thickness of all sections as much as possible. Ribs, joints, bosses and other irregularities should be kept to a minimum. Corners should be rounded, sharp angles filled in.

These and other fundamental rules are needlessly violated in many designs. A general tendency among designers is to "beef up" iron castings.

At Rosedale, the manufacturer's design for a 31-ft wind tunnel base called for solid tracks. By altering the design and coring out the sections, the foundry was able to reduce casting weight by 11,000 lb.

Try Consultation—Foundries feel much can be accomplished by acquainting designers with properties of their metals and with foundry practice. However, the job of making the rules jibe with functional requirements can get pretty complicated. They urge designers to consult with them before arriving at final dimensions.

Benefits of consultation are brought out in one example. Two companies came to a foundry with patterns for the same part—a wheel both were making for the government. The foundry recommended a different pattern to both. One company adopted the new pattern and got its parts at a cost of 18 cents a pound. Weight of each casting was 1000 lb. The other company stuck by its original pattern. The same parts cost it 20 cents a pound. Casting weight was 1070 lb.

Tips on Improving Castings Design

Consult foundrymen or patternmakers before making final drawings. Their advice can save time and money.

Equalize the thickness of all sections whenever possible. Avoid abrupt section changes.

Bring minimum number of sections together. Fillet all angles correctly and use gentle contours.

Design so all members increase progressively to assure solidity. Trapped molten areas, or hot spots, result in voids when the metal hardens and shrinks. Use ribs, bosses, lugs and pads with discretion.

Avoid multiplicity of cores. Design inner walls of lesser thickness than main body.

Provide vent outlets and cleanout openings.

Do not specify dimensional tolerances closer than necessary.

Simplify design as much as possible.

Avoid overspecifying your safety factors.

Source: Meehanite Metal Corp.

Die Casters Gear For Big Year

Job Shops Expect Sales To Top 1956

Independent die casters say last year was their second best ever.

But they are confident that 1957 will move into the number two slot.

Automaker buying expected to recover from the tumble it took in 1956.

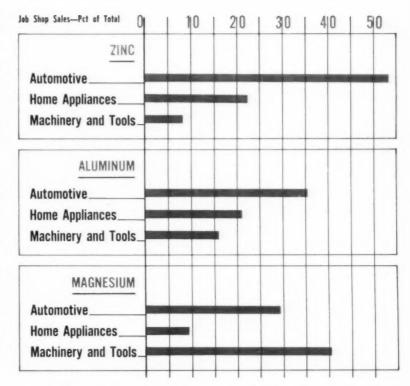
■ Die Casting job shops had their second best year in 1956. Casters say they have a good chance to top this in 1957. But most agree they won't reach the peak sales of 1955. The key factor is automotive.

Here's how one major shop explains it: Automakers overstocked in 1955, hence the record. They operated partially off these inventories in 1956. Buying will be balanced in 1957, he believes, resulting in improved, but not record, business.

Expect Auto Pickup — Another die caster selling Detroit concurs. But he says auto business in the first two months has been slow. However, he expects a pickup in orders this month, continuing through June.

Independent casters are making the lion's share of total shipments. In 1956 integrated, or "captive", operations accounted for only 52,-500 tons of the total aluminum die casting output of 183,625 tons. Total of zinc castings were 362,500 tons. Captives shops turned out 128,500 tons.

The American Die Casting Institute says business held up well in 1956, despite the drop in Detroit buying, because demand from all other customers increased. Actually, only zinc die castings, selling more than half of output to automakers, were off—by 11.5 pct.



Die Casters' Biggest Customers in '56

Aluminum, magnesium, and brass picked up.

Accounts Receivable — A die casting shop not selling the automakers says business this year has been "excellent." He anticipates some slight dropping off, but expects 1957 to be a good year.

Total job shop die casting sales in 1956 were \$679.7 million. Sales of castings brought \$429.7 million. Services, such as finishing, and sales of dies and special tools accounted for the balance.

Zinc die castings are still the biggest item in the job shop market. In both tonnage and dollar volume. The 234,000 tons sold in 1956 brought \$214 million. This was 65 pct of the total market.

Use More Aluminum — Aluminum in dependent die casting volume was about half as much as zinc in 1956. But the 131,125 tons of aluminum die castings accounted for almost as much revenue, \$201 million. This was 71 pct of the total industry output. And die casters used an additional 15,000 tons in alloys, reflected in zinc statistics.

Most independent shops say that use of aluminum in die castings is still growing. But no one will hazard an estimate of what the market potential is. One outfit says the increase in hot metal contracts between aluminum producers and automakers may restrict growth in job shop output.

Builders Pace '56 Steel Users

Automotive Drops to Second Place

Users consumed 83.2 million tons of steel in '56, more than a million tons below '55.

Two buyers, automotive and construction, took almost 40 pct of the total.

Most users, except automotive and agriculture, boosted consumption over that of '55. Auto use dropped 20.4 pct. ■ For the first time since World War II the automotive industry has lost its rank as the largest consumer of steel. The construction industry, taking more than one-fifth of all steel shipments in 1956, forged into first place. Construction users, according to an IRON AGE analysis of shipments reported by the American Iron and Steel Institute, purchased over 16.7 million tons of steel in 1956. This was a gain of

6.7 pct over their 1955 total of 15.6 million tons.

The Auto Slump—It also represented 20.1 pct of the total of 83.2 million tons of steel shipped in 1956 to all industry and export. Total shipments last year fell 1.7 pct below the 1955 total of 84,717. The figures in each case include shipments from producing mills, warehouses and distributors.

Automotive buyers, taking only 15.6 million tons of steel in '56 as opposed to 20.9 million tons in '55, saw their steel use drop 20.4 pct.

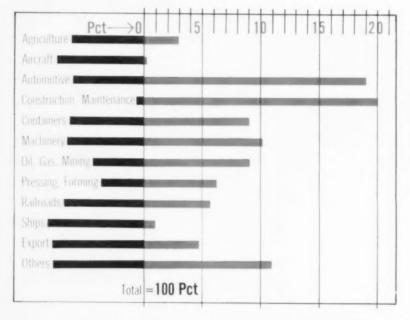
Gains for Most—Most other steel users—machinery, shipbuilding, the railroads, containers, pressing, forming, stamping, aircraft and others—all consumed more steel in '56 than they did in '55. The two exceptions were automotive and agriculture.

Farm consumption of steel products was down slightly to 2.5 million tons, contrasted with 1955 use of 2.8 million tons.

Third place in steel consumption in '56 went to machinery and tools. This industrial group bought 8.5 million tons last year.

More for Cans—The container industry was fourth largest consumer with a total shipment record of 7.7 million tons, an increase from the 7.5 million tons of 1955.

Big Steel Users in 1956



Steel Distribution by Consuming Industries

In Thousands of Net Tons

	19	950	15	951	15	952	15	953	15	954	1	955	1	956
	Tons	Pet	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct
Agriculture Aircraft Automotive Construction and Maintenance Containers Machinery, Tools Oil, Gas, Water, Mining Pressing, Forming, Stamping Raifroads Shipbuilding Exports All Others	3,094 56 15,746 12,363 6,409 5,812 6,619 4,601 4,796 355 2,783 9,560	4.28 0.08 21.80 17.12 8.87 8.05 9.16 6.37 6.64 .49 3.85 13.29	3.281 167 14.488 14.184 7.242 7.033 6.735 4.617 6.558 981 3.068 10.573	4.16 .21 18.36 17.98 9.18 8.92 8.54 5.85 8.32 1.25 3.89 13.40	2.764 153 12.232 11.749 6.218 6.131 5.973 3.640 4.575 1.152 3.665 9.750	4.07 0.23 17.99 17.28 9.15 9.02 8.78 5.35 6.73 1.70	2,547 180 16,506 14,225 6,769 7,307 7,211 4,994 5,454 976 2,998 10,985	3.18 0.23 20.59 17.75 8.45 9.12 8.98 6.23 6.80 1.22 3.74	2.417 97 12.959 12.906 6.427 5.802 6.097 3.828 2.780 549 2.774 6.517	3.83 .15 20.52 20.44 10.18 9.19 9.65 6.06 4.40 .87 4.39 10.32	2,802 107 20,834 15,611 7,462 7,854 7,336 5,295 3,989 667 3,583 9,186	3.3 .12 24.6 18.4 8.8 9.3 8.7 6.3 4.7 7.78	2.456 153 15.952 16.734 7.650 8.466 7.620 5.347 4.815 853 4.063 9.138	3.0 0.2 19.2 20.1 9.2 10.2 9.2 6.4 5.8 1.0
Total	72,233	100.00	78,929	100.00	68.004	100.00	80.152	100.00	63.153	100.00	84.717	100.0	83,251	100.0

IRON AGE compilation and distribution formula from data by American Iron and Steel Institute.

Stainless Set Record Despite Strike

Despite the handicap of last summer's steel strike, stainless steel producers set another shipment record last year.

American Iron and Steel Institute reports total mill shipments of stainless steel products in 1956 of 687,699 net tons, slightly over the previous record of 686,449 tons shipped in 1955.

Increases were spread over several industries. Aircraft accounted for 33,990 tons, 52 pct over 1955. Big reason for the aircraft boost was the growing use of stainless in supersonic jets and missiles. Aircraft used 32,000 tons in '53, but this was due to greater unit production.

Fills Need—In the electrical machinery and equipment industry, stainless use rose 120 pct last year, while shipments to the machinery, industrial equipment and tools classification jumped 38.6 pct. Together, these equipment and machinery makers consumed 76,664 tons of stainless in 1956.

Such increases, comments AISI's Committee of Stainless Steel Producers, "mirror the trend toward equipment designed to operate at higher temperatures and service loads calling for the strength, heat and corrosion resistance of the stainless steels."

Auto Use Down—Mill shipments to the domestic and commercial equipment category were 15,315 tons—slightly above the 1955 figure. Similarly, construction and maintenance use was up slightly over the previous year, with 1956 at 22,071. But stainless shipped to appliance, utensil and cutlery manufacturers was off 8 pct from the 1955 peak of 48,162 tons. Of the three, only cutlery showed a gain over '55. And auto industry use of stainless dropped 28 pct during 1956.

Warehouse shipments rose 21 pct to a 1956 total of 227,465 tons, roughly one-third of total stainless shipments.

Buying Mood Hits Farm Belt

Farm equipment makers report sales gains of 9 to 17 pct, growing backlogs.

A lot depends on farm prices, which are sagging on some products.

Drought is another worry for builders. Soil bank helps, but also hinders.

• With the air of men urging a bull through the crockery department, farm equipment sales chiefs admit sales prospects look increasingly good.

One manufacturer reports tractor backlogs of 30-60 days. Another admits to 30 day backlogs on "some models of tractors." One producer's sales are up 16 pct. Another has scored a 9 pct gain. Another is up 17 pct in his first fiscal quarter.

Cause For Jitters — Why the caution? (1) Corn-hog prices affect farmers' willingness to buy in the major farm equipment consuming area in the U. S. Pork prices slipped three weeks ago and farmers are beginning to complain. (2) Rains in Texas may have wetted down the dust, but one rainstorm doesn't end a 5-year drought. (3) Soil bank payments put more money in the farmer's pocket, but reduce the amount of land he needs to till, hence the amount of equipment he needs to work his acreage.

The consensus: unit sales of farm machinery and tractors will advance over 1956 levels by 5 pct, dollar volume by 10 pct.

Why '56 Sagged—Among most farm equipment producers, the export market remained steady or even gained ground in '56. The battle was fought and lost in the domestic field. The farmer just wasn't buying.

Sales spurted in an October flurry that aroused some hope, despite scattered warnings that it was (1) no more than the usual seasonal fall gain, and (2) dealers buying early to beat expected price increases. The pessimists proved right.

Ups and Downs — Despite a December sales gain over November, December tractor sales leveled at 23 pct below the 1955 figure. Implements did as badly, slipping 22 pct below third quarter sales in fourth quarter and remaining 22 pct under fourth quarter 1955.

Hence the guarded reaction to present gains. Last year began with high hope and finished running last. Preliminary sales statistics hint 1956 may have been poorer than 1954, the industry's worst year since the close of World War II.

Steel Buying Off-Sales department caution is carrying over into the purchasing departments. Steel buyers hold a tight 60 day inventory, paring it to the bone and depending on short delivery mill steel to avoid emergency buying. About two out of five are still reducing inventory, and plan to do so into second quarter. Even so, total second quarter steel purchases will run 10 pct over the elevator drop of second quarter 1956. Steel ordering would flush up like a scared pheasant should a boost in automotive demand tighten sheet and bar supplies.

Sales chiefs are watching dealer sales with hawklike eye. General opinion is that the healthy level of retail tractor sales is still reducing dealer inventories. Inventories of implements are slightly heavy. A firm reports dealer tractor inventories at 10 pct below year ago levels, with retail sales running 10 pct above year ago levels.

Nuclear Power Progress Lags

How Much Is Industry To Blame?



Admiral Rickover: Lays it on the line to industry.

Hope for a speedy journey into the era of nuclear power now seems uncertain.

The Atomic Energy Commission is running into trouble in an unexpected quarter.

This straight-from-the-shoulder criticism may help industry solve the problem.

 U. S. industry is charged by a top Defense Dept. official with letting down the nation's atomic energy development program in an area where it has long prided itself technical ingenuity.

Rear Admiral H. G. Rickover, chief of the Naval Reactors Branch, U. S. Atomic Energy Commission, let go the salvo:

"We had expected that industry's technological know-how was sufficient to take care of modest departures from conventional practices. We found this not to be so."

Output Slow—The one factor which today most severely limits exploitation of nuclear power, he claims, is design and production of reactor components—the conventional items such as heat exchangers, pumps, valves, and instrumentation.

"The cost of these components has been high and delivery time poor," he charges. "In fact, experience with four operating plants of the Naval Reactor Program shows that these parts have proved less reliable than the reactors themselves." He continues:

"Failure of a component in a nuclear power plant has far greater significance to plant safety and operation than a similar failure in a conventional plant. The reason, of course, is the radioactivity hazard. Any chance of failure must be eliminated.

Quality Is Vital—"Today, many companies interested in nuclear power dissipate the efforts of their technical manpower on academic reactor studies, but give little attention to the overall reliability of the plant.

"Conventional - type components when used in nuclear power plants must meet far more exacting standards and demand a higher order of engineering than in normal industrial applications. This is a challenge to industry which is not yet thoroughly understood or accepted."

He gives what he thinks are two main reasons for industry's failure thus far: (1) lack of fundamental understanding of even common materials and their fabrication, and (2) lack of management attention to the work, both from an organizational and a detailed technical standpoint.

Areas of Ignorance—Specifically, he points to industry's meager knowledge of stainless steel fabrication and welding; to the poor showing in production of carbon steel forgings and castings, and stainless steel castings. Rejects have been running as high as 50 pct, at a cost of millions of dollars and months of valuable time wasted.

"Even more important," Admiral Rickover states, "is the need for an entirely new quality level of management to insure a satisfactory product."

"Management will have to pay more attention to the training of personnel in administrative methods and in purchasing and expediting."

Mills Ease Pressure for Cranes

Yet Builders Will Be Busy Through '58

Lack of plates and structurals is hurting production. Deliveries running 12-16 months.

Slow business and turn-down on fast-tax writeoffs making mills hesitate.

But builder backlogs are fat and incoming business is running high.

• Heavy crane builders are in one of their most topsy-turvy markets in years. Steel mills, their biggest customers, aren't in a hurry for delivery any more. Builders haven't enough steel and may get less. Yet there's enough business on the books to top last year and keep everybody busy through 1958.

For the crane builders, the biggest market trend has been easing in pressure from steel mills for delivery because of market weakness and governmental refusal to grant fast tax write-offs. Mills are slowing down expansion construction while they spread out their dollars. Several big cranes which were to have been delivered this spring have now been deferred until fall.

Limit On Steel—Despite the financial and steel procurement problems, builders expect to ship about \$77 million worth of equipment this year compared to about \$73 million last year, according to J. H. Peritz, executive secretary of the Electric Overhead Crane Institute, Washington, D. C. "But there's enough business on the books already to assure a good 1957 and nearly full schedules well into 1958," he said.

Mr. Peritz feels that availability of plate and structurals is still the limiting factor on production.

Delivery times on heavy steel mill size equipment are now about 12-16 months. On smaller sizes they are about a year or less. With easing of pressure for delivery, most builders have enough open shop time to handle rush orders if steel is available.

Big Cranes Wanted — Size of cranes is steadily going up. Some mills are now using a forked spout which pours hot metal into three ladles at once.

The world's biggest ladle crane—of 500-ton capacity—was shipped last month from Morgan Engineering Co., Alliance, O., to Sparrows Point, Md. Two more are being built. Morgan's competitor across the street, Alliance Machine Co., is negotiating to beef up an existing crane in an eastern mill to even larger size—600 tons. And the trend is here to stay with 600 ton openhearths being built.

Incoming Orders — Builders of major market size cranes of 125-ton capacity like Cleveland Crane and Engineering Co. are booked into the second quarter of 1958 and backlog is growing. Steel procurement for this firm has been such a headache, it has temporarily curtailed manufacture of its line of shears formerly built for dealers and distributors stock.

Harnischfeger Corp. says: "Outlook is very good and business, particularly in heavy machinery, is holding up well."

Jack A. Handley, president of Whiting Corp., has this to say: "Our business level is very good and the company backlog is at the highest level since 1952."



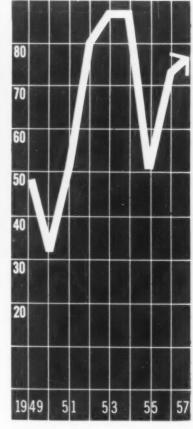
A Big Lift For Cranemakers

Shipments of Electric Overhead Cranes in Millions of Dollars

1957 = Estimated

Source: Electric Overhead

Crane Institute



Tax Relief For Small Business?

Pressure Grows But Foes Are Powerful

Small firms have good support in Senate, as both parties plump for tax relief.

But Senate and House tax committees are opposed. And so is Secretary Humphrey.

Politics may dictate relief for individuals as well as business next year.

 Pressure for tax cuts to aid small business is building up in Congress.
 The lawgivers could go either way this year. Political, rather than fiscal or moral considerations, will probably decide the issue eventually.

Strength of the drive to give small firms a tax break this year is evident in the Senate. Forty-two Senators, of both parties, are pressing for a bill to lower the basic corporate tax rate on profits up to \$25,000 a year from the present 30 pct to 22 pct.

Stumbling Blocks — Republicans would raise the surtax rate to 30 pct, leaving the total rate of 52 pct. This would cost the government an estimated \$650 million a year. Democratic sponsors want to raise the surtax to 31 pct, to recoup about half the loss.

There are several major stumbling blocks to this type of tax reduction:

A method would have to be found to give the same type of tax break to unincorporated firms, which account for most of the small business bloc.

Strong belief by such fiscal leaders as Treasury Secretary Humphrey that the first tax plums should be across the board (in the form of personal tax cuts so the general taxpayer would share). Opposition to a cut this year by leaders of both Senate and House tax committees is also a stumbling block in the way of Congressional action,

Political Angle—The politicians haven't forgotten that while 1957 is not an election year, 1958 is. A tax cut next year would be politically more useful.

Against this is a growing fear that politically and economically, a tax reduction can't be postponed much longer. A leader such as Secretary Humphrey doesn't drop a bomb as big as his "hair curling" depression warning, no matter how theoretical, without rocking politicians into action.

Maybe Next Year—The seeds for a tax cut this year have been sown. While they could bear fruit in 1957, it is more likely the lawgivers will spend this year making token budget cuts, and plow the ground for tax reductions next year.

There's solid planning behind the Senate's talk of tax cutting. Several ways to reduce the tax load on smaller firms have been charted, such as the Sparkman plan. (see box) Here are the main points in the chief taxcut plans now before the Senate:

Sen. Fulbright: Lowering of the corporate tax rate from 30 to 22 pct on income below \$25,000. Raising the surtax rate from 22 to 31 pct on corporate income exceeding \$25,000.

White House Tax Committee: Dropping the corporate rate from 30 to 20 pct on the first \$25,000 of income. Extension of easier depreciation rules to include used equipment up to \$50,000. Granting of partnership tax rights to small firms with ten or fewer stockholders.

Sen. Potter: Cutting by one-third the tax on the first \$25,000 of corporate income. Speeding depreciation deductions on buying of used property. Permitting small firms with ten or fewer stockholders to be taxed as partnerships.

How Sparkman Plan Would Help Small Business

Tax rate pct

			Present	Proposed	
Income	Present	Proposed	Tax	Tax	
\$5,000	30.0	5.0	\$1,500	\$250	
10,000	30.0	7.5	3,000	750	
15,000	30.0	10.0	4,500	1,500	
20,000	30.0	13.75	6,000	2,750	
25,000	30.0	18.0	7,500	4,500	
50,000	41.0	31.5	20,500	15,750	
100,000	46.5	38.25	46,500	38,250	
250,000	49.8	47.7	124,500	120,750	
375,000	50.53	50.53	189,500	189,500	
500,000	50.9	51.65	254,500	258,250	
1,000,000	51.4	53.33	514,500	533,250	
5,000,000	51.9	54.68	2,594,500	2,733,250	
10,500,000	51.95	54.83	5,194,500	4,583,250	



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Even if your company can't afford a staff of economists, there are many business indicators available for use.

AMA survey shows what type of market forecasting is used in industry cross section.

One problem: Executives frequently don't trust their own forecasting staff.

• In most companies, business forecasting is far from an exact science.

As a rule, large companies employ economists, organize forecasting sections, or rely on detailed surveys of one kind or another. But in a surprisingly large number of companies of all sizes, executives still rely on "seat-of-the-pants" charting of their business course.

Like Business Papers—According to a survey of company presidents, conducted by the American Management Assn., most company presidents keep abreast of economic

developments through business magazines, trade papers, newsletters, government statistics and other printed sources.

And nearly all of them (44 out of 56 replying) report that they rely on informal personal contacts as a source of information. And, surprisingly, tendency to rely on friends or business associates as sources is stronger among executives of large companies than of smaller firms.

What to Watch—Here, in order of related importance, are the important business indicators followed by business:

Consumer buying power; own industry trends; consumer's outlook; population statistics; gross national product; new construction; Federal Reserve Board index of industrial production; prices; employment statistics; inventory levels; regional business trends; federal budgets and government spending; manufacturers' new orders.

As the survey points out: "There is no reason why an executive, even

in the smallest firm, cannot take advantage of some of the readily available economic data."

Survey Results—Other highlights of the AMA presidents' survey:

The job of forecasting is definitely assigned to staff personnel in 43 pct of responding firms.

Business trends are most often used to study the critical question of expansion.

Consumer buying power in the economy as a whole is watched by more firms than any other economic indicator. Most executives rank this indicator higher than trend figures in their own industries.

Business forecasting within a company is a recent development. Most firms first assigned personnel to forecasting in 1945 or later.

Lack Confidence—A sidelight of the forecast points up lack of confidence of management in its own forecasting. Four of 20 reporting that the company's forecasts are developed by staff forecasting personnel reported that they do not personally rely on them.

Extent on which consumer buying power is relied upon is indicated by the number of firms producing industrial goods only which still count on this indicator as a major forecasting factor.

In general, firms tend to follow this pattern:

Study the Customer—Consumer goods producers study the potential buying power of the general public; industrial goods producers study the market for industrial goods among consumer goods producers. They logically place emphasis and study on the outlook for firms which buy their products.

Where Company Presidents Spot Business Trends

	Company Size			
	Small	Medium	Large	
Trade papers, magazines, etc.	18	17	14	
Personal contacts	12	15	17	
Trade groups	15	13	15	
Reports from own company executives	7	6	13	
Consultants	11	5	5	
Staff forecasts	6	3	11	
Other sources	1	4	3	

Based on responses of 56 company presidents.

Source: American Management Assn.

I-T-E CIRCUIT BREAKER—KD (3,000 amp. rating) showing progressive assembly with Revere Copper and Aluminum Extrusions in place. I-T-E Circuit Breaker—KE is same type with 4,000 amp. rating.

REVERE ALUMINUM and COPPER EXTRUSIONS



COPPER for conductivity



ALUMINUM for economy

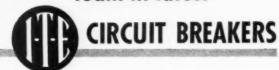


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-form a Money-Saving team in latest



Revere T. A. Service an Important Factor in Ultimate Design of Parts

The larger of the two extruded and drawn copper shapes shown at extreme left started out on the drawing board as two pieces. It was thought that a single shape of this size could not be made satisfactorily. At this point, I-T-E Engineers got together with Revere's T. A. (Technical Advisory) Service and threshed things over. The final result is the one-piece extrusion shown and a reduction in machining time.

Aluminum was selected for the other extrusion shown because I-T-E found that it cost less per pound of metal and had a higher strength ratio when compared to a casting. Also, space was a factor. In all, Revere supplies 5 copper and 2 aluminum extrusions for KD and KE type I-T-E Circuit Breakers. All were designed to fit specific requirements of I-T-E Engineers. Where it could be used satisfactorily, aluminum was applied because of economy, while current carrying members called for copper.

This is still another example of Revere supplying the metal that will do the best job and with the greatest economy . . . be it aluminum, copper or any one of their alloys. So, with new things happening all the time in non-ferrous metals it can pay you to keep in close touch with Revere,

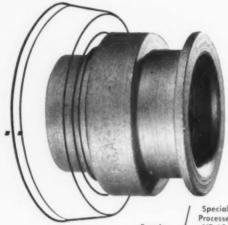
"SWITCH!" said Ostuco

... and savings were surprising!

Pleasant surprise, too! Bearings Company of America, Division of Federal-Mogul-Bower Bearings, Inc. Lancaster, Pa., was machining Ostuco seamless tubing to make a clutch release bearing collar used as original and replacement equipment. Results were fine!

Then word came from Ostuco, recommending a switch to Ostuco's newly developed NP-60, tubing specially processed for machineability. Cost was slightly higher, but BCA and Ostuco engineers predicted the savings would justify the change.

they switched.



and they SAVED!

Regular

Production per 8 hour shift (units).....

Production time per 1000 units (hours)... 12.35 Total Labor per 1000 units (man-hours)... 13.09

Specially rocessed NP-60

840 10.03

10.63

Besides the savings, Bearings Company of America was pleased with the better finish of the new part. They point out that the collar in photo above "shows the finish as it comes directly off the machine."

It happens this way often enough to warrant checking with Ostuco about your tubing applications and production problems. Contact your nearest OSTUCO Sales Engineer or write direct to the Shelby factory -there's no obligation!



SEAMLESS AND ELECTRIC RESISTANCE WELDED STEEL TUBING-Fabricating and forging

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company • SHELBY, OHIO
Birthplace of the Seamless Steel Tube Industry in America

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CANADA, RAILWAY & POWER ENGR. CORP., LTD EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY 225 Broadway, New York 7, New York

Michael Pinto

Nothing Succeeds Like Service

The first million dollars doesn't look as big as it used to, but it's still hardest to make.

Mr. Pinto found it a lot easier than most because he believed what he learned in school.

While others were building better mousetraps, he was building better men.

• Michael Pinto, a mild, unobtrusive engineer with a flair for organizing, built one of the country's largest engineering businesses in little more than a decade.

Success is so becoming to him he was elected chairman of the Michigan Chapter of the Young President's Organization, which restricts its membershp to executives who have done more than \$1 million business annually before reaching 40.

Departmentalizes — His Pioneer Engineering Corp., with headquarters in Detroit, operates under the proposition that an engineering business must find a way to increase size and basic structure without giving up the individualized service which engineering projects demand.

Mr. Pinto achieves this by subdividing activities under a staff of assistant chief engineers, each with his own staff of specialists in a specific field. The divisions range from research to detail tooling. From 350 to 400 engineers are kept busy on client projects.

Perennial Student — "The engineering business," says Mr. Pinto, "has become a national necessity. Firms specializing in engineering services permit our country to use



its available engineering manpower most effectively." Because Pioneer's main operation is in Detroit, a large chunk of its business is necessarily automotive. Yet Mr. Pinto has soundly diversified his contracts in the fields of appliances, aircraft, and ordnance.

When he was graduated from Lawrence Institute of Technology, he set out to get as thorough a knowledge of design and tool engineering in as short a time as possible. He has been back to college far oftener than most executives. Last spring he attended his sixth seminar on industrial economics at Harvard.

Classroom Theories Work-The

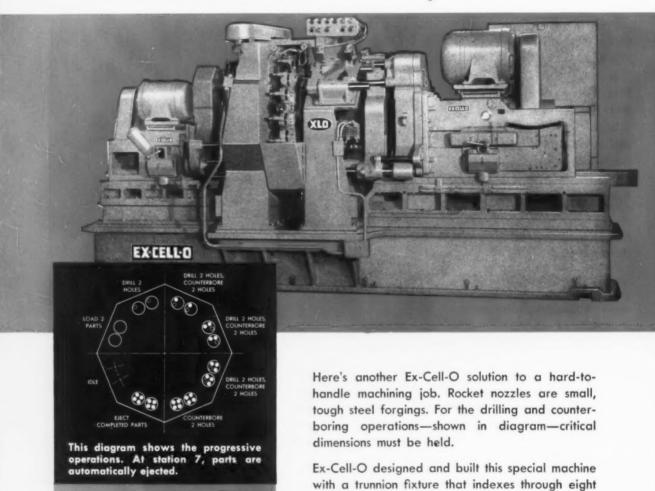
biggest asset an engineering business has is its personnel, Mr. Pinto points out, and he puts forth much effort training his engineers. He has even gone so far as to import the dean of a major university with a roster of professors to bolster the company training program.

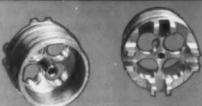
As an incentive, he gives key employees the opportunity to buy shares in the company. Last year the shares increased 43 pct in value.

And to bridge the gap between top and lower management, he created a Junior Board of Directors, which is proving an effective liaison tool. While others are discounting the theorists, Mr. Pinto is putting to good use what he learned in the classroom.

SPECIAL EX-CELL-O MACHINE

Drills and Counterbores 514 Rocket Nozzles per Hour





Front and rear view of completed part. The rocket nozzle is tough forged steel; location of holes to each other and to the four pronged slots is critical. Ex-Cell-O designed and built this special machine with a trunnion fixture that indexes through eight stations. Two Standard Ex-Cell-O Slide Type Hydraulic Power Units—one for drilling, the other for counterboring—actuate the multiple spindle heads. Features of the machine include simplified design, high productivity, safety and sturdiness. . . . When you're faced with a tough machining problem, call in Ex-Cell-O.



EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS . GRINDING SPINDLES
CUTTING TOOLS . RAILROAD PINS AND BUSHINGS . DRILL JIG BUSHINGS
AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS . DAIRY EQUIPMENT

Look Out for a Price Squeeze

In spite of increasing manufacturing costs, it won't be easy to pass on price increases.

Availability of materials and easing markets put the consumer in a position to resist.

■ One of the toughest battles to be fought by business this year will be on the battleground of prices. And forces are building up that will put most segments of industry at a distinct disadvantage.

There is scarcely any business that won't be caught between the pincers of rising costs on one hand and increased competition on the other. Many industries have been fighting this squeeze for some months.

Others have been blessed with an excess of demand over supply. Increased availability of their products will bring back competition that has been absent for some time.

Not Without a Struggle—A few months ago many customers would have accepted a price increase without complaint. In fact, many were paying premium prices for some products and materials. But with the markets easing, the same consumers are not likely to take a fat price increase with cheerfulness. And they aren't likely to be sympathetic to their supplier's own increased costs.

A new pressure against price boosts has been added. That is moral suasion. With implied threat of controls, President Eisenhower has indicated that business has the moral obligation to hold the price line. Within its own ranks, business is expected to act as a leader in the battle against inflation.

Up Escalator—This same threat was held out against labor, too. But, for the most part, that was idle talk. Most major industries are tied to long-term contracts, with built-in raises granted annually. Another

aspect is the escalator clause. As prices and cost-of-living go up, the cents-per-hour also add up.

So in many cases the dual pressure on labor and business turns out to be just pressure on business.

Business in the Middle

Pressure Grows — There is little doubt but that your business will be in the middle. All costs of doing business are going up—labor, materials, machinery, financing and planned construction.

Individual companies and even entire industries are going to sharpen their pencils when figuring prices this year. What appeared to be an automatic increase a few months ago may not be so automatic in an easing market.

No Alternative — But industry has little opportunity to absorb costs. Some, like steel, are almost committed to maintaining or widen-

ing profit margins to attract capital and to finance needed expansion and modernization.

There is some leveling off in the inflation-like spiral. Some of the more volatile commodities such as scrap and nonferrous products already are down considerably.

Makers of products in competitive markets such as appliances and farm implements are suffering from inability to boost prices in keeping with increased costs. There is even some talk of lower automotive prices, although it wouldn't be a good bet to wait if you're in the market.

Labor Draws Up Tax Plans

Plan of Attack—No doubt your industry group will make its opinion felt in Congress before the new tax law is enacted. But you might like to know what kind of a tax law labor would like.

Here's what the AFL-CIO has in mind as its tax program:

Excise taxes—Allow the scheduled cuts to go into effect April 1.

Corporate taxes — Maintain the existing (52 pct) rate.

Small Business — Reverse the present normal and surtax rates to provide for a normal corporate

rate of 22 pct and a surtax rate of 30 pct on corporate income above \$25,000.

Personal income — Increase the exemption from \$600 to \$700 to provide relief for low and moderate income families.

Dividends—Repeal provisions of the 1954 law which provide for "special status" of dividend income and which alter the methods for computing depreciation.

Special allowances—Abolition of special depreciation allowances for oil and other natural resources.

Framemakers Weigh In for Fight

The Unit Body Flexes Its Muscles

Automobiles are here to stay but their parts keep going and coming.

A design change can ring the death knell for a supplier, if he is taken off guard.

Next to face the battle for survival may be the automotive framemakers.

■ Is the unitized body eventually going to replace the standard frame used in today's automobiles? You can hear arguments pro and con on the subject. The topic was brought up anew at Midland Steel Products Co. in Detroit.

Midland for over 50 years has

been one of the industry's principal suppliers of automobile frames. It numbers among its customers members of the Big Three. At one time or another, the company supplied auto frames for just about every major producer, but like most suppliers today, Midland knows that it has a fight on its hands.

The Challenge — The bulk of Midland's business has always been automotive. With the increase in competition in the postwar period, the company has tried to become more flexible in order to survive. A new management team has taken over the operation of the company. Its strategy, like that of so many other parts producers, is to diversify.

At the same time, the company

wants to keep abreast of its competition by introducing new products and methods for its automotive customers. A hint of things to come is contained in a company statement: "At present, Midland Steel Products is busy with improvements on present products for present customers. The future promises to be filled with new challenges, new methods, new products for customers, both old and new."

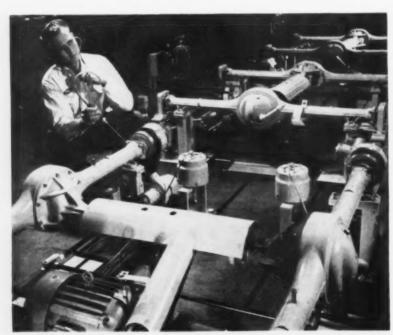
The Credits—The statement contains a hint that something new in automotive frames is soon going to be introduced to the industry. Could it be the unit frame?

It's an open secret that Lincoln, at least, is going to adopt the unitized body next year. It's debatable if any other automakers are considering the move, although you can hear reports that Ford is considering the eventual adoption of the unit frame for all its cars.

What are the advantages? American Motors Corp., which has been using the frame for years, claims that it is much safer because of its impact absorption in a crash. AMC says the passenger is safer because the unit frame absorbs most of the impact before it reaches the passenger.

The Debits—On the debit side, it is claimed that manufacturing the unit body is a costly operation. Some engineers say that any advantages inherent in the unit body are outweighed by the cost of manufacture. Such an operation, it is said, is feasible where a company has only one main assembly plant and is not faced with the extra cost of dual tooling.

At the same time, you can hear arguments that today's standard



SOUNDS GOOD: A technician in Chevrolet Engineering Center Laboratory uses a stethescope to check rear wheel bearings undergoing a durability test. Any flaws in the bearings can be detected by a hum or tapping.



There's a Good Reason why

ZINC DIE CASTINGS

are so widely used

... at HOOVER

...IT'S



Design engineers at The Hoover Company found that DUCTILITY provided the necessary answer to their problem of using ZINC Die Castings in the agitator of the upright electric vacuum cleaner.

Because of the helical contour of the brush, the metal back could not be die cast to the required shape since the anchoring holes for the bristles would not be parallel to the motion of the die. The problem was neatly solved by a die caster who knew how to use the exceptional qualities of ZINC Die Castings.

The brush backs were cast straight, the bristles anchored in the holes and the castings were then cold formed approximately 115° to give the necessary helical contour. Even with the extra forming operation, die casting proved to be the most economical method of production since no machining was necessary.

Ductility is just one of the many physical and mechanical advantages that make ZINC Die Castings so widely used by manufacturers who want the best product with lowest costs of parts and assemblies.



The straight die casting (at top) is put into production without any machining. The bristles are fastened in place and the forming operation twists the bar to the proper curvature for installation on the agitator.



THE NEW JERSEY ZINC COMPANY 160 Front Street, New York 38, N. Y.

The research was done and the Zamak die casting alloys were developed with

HORSE HEAD SPECIAL

99.99 + % Uniform Quality

ZINC

Automotive Production

WEEK END	NG	CARS	TRUCKS		
March 9,	1957	141,393	20,130		
March 2,	1957	140,362	21,743		
March 10,	1956	132,840	24,165		
March 3,	1956	132,889	24,643		
TO DATE	1957	1,383,400	212,100		
TO DATE	1956	1,352,100	240,900		

*Estimated. Source: Ward's Reports

frame is actually stronger than the unit body. It's possible that this is the case. In any event, it's obvious there are going to be some changes in auto frames in the near future. Those producers who don't switch to the unit body are likely to use a different form of the standard frame.

Tubular Trends — One possible forerunner of things to come is a form of the tubular X-frame being used on this year's Cadillac. Side members are completely eliminated and engineers claim that it is safer. First, because it can be shown that the frame is stronger despite its lack of side members. Secondly, the X-shape makes it possible to have the car's body sit lower on the frame.

This leads to a lower silhouette, a lower center of gravity and safer operation. Within the next few years, both types of frames are likely to be adopted. The unit body may be used by producers who have only one assembly plant. The X-type frame will probably be adopted where volume production and multiple assembly points are the main consideration.

Quiet, Please!

How quiet can an automobile be? The answer: Never quiet enough to suit some engineers.

The various types of noise produced by an automobile create one of the biggest problems for engineers. Elimination of sound is even more difficult because there is no strictly scientific means of judging noise. People react differently to noise and engineers are no exception.

Noise reduction programs are seriously considered by all automakers, especially producers of luxury cars. Take the Continental, for example.

A hi-fidelity tape recorder is placed inside the car to record noises caused by engine, wind, road, exhaust, tires and body vibrations. These noises are recorded at various speeds and on different surfaces.

After a test, the tape is played back to a panel of engineers who decide how the noise can be eliminated by adding insulation or rearranging acoustic material.

How GM May Plan To Regain Sales

The most popular conversational piece in Detroit this year is still the relatively slow sales pace of General Motors Corp. February production figures show that every GM car division produced fewer units than it did in the same period last year.

Actually, nothing drastic has come about. The corporation is still unchallenged in total market penetration. Nor is it likely to be. So far, however, it is estimated that GM's sales are off about 4 pct from 1956.

Rumors Flying-The rumors and

speculation continue at a rapid rate. First, there was the report that GM planned the whole thing. Next, it was rumored that the company had ditched all its 1958 dies and was going to bring out its 1959 cars a year early. Then, there was speculation that the 1958 models were going to be introduced much earlier than originally planned in order to recapture some of the lost ground. Now comes the latest report.

There isn't any doubt that the Corporation is worried about its sales. But because of the time factor involved, it is impossible to bring out new cars much earlier.

However, something has to be done and the only alternative is to cut prices. Keep in mind that this is merely a rumor but also that there may be some basis of fact in it.

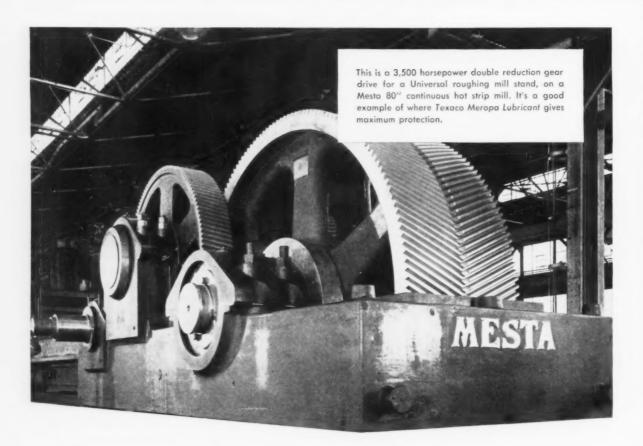
Price Angles—It's extremely doubtful that GM would reduce its suggested list prices. Such a move would have a serious effect on competition and could stir up cries of "monopoly" in Washington.

If GM were truly considering such a move it's more likely that it would take the form of an increase in discount rates to dealers.

THE BULL OF THE WOODS

By J. R. Williams





POLAR ADDITIVES GIVE EXTRA PROTECTION TO COSTLY GEARS

Polar additives in *Texaco Meropa Lubricant* keep it adhering to gears under *all* operating conditions, including heat, pressure, severe moisture. *Texaco Meropa* has extreme pressure properties that give it a tougher lubricating film. It keeps gears working safely under extra-heavy or shock loads.

What's more, *Texaco Meropa Lubricant* resists oxidation and thickening, won't foam or separate—and it's non-corrosive. Result: Longer life for gears and bearings—less maintenance cost.

The *right* lubricant can save you money. The Texaco Lubrication Engineer in your area will help you do it. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

Unions Start Cleaning House

If They Don't, Government Will

Investigation of union scandals is only scratching the surface.

It's up to labor to look under its own rugs, now that the direction has been pointed.

Big question now: What are Dave Beck's plans, now that he has trouble at home? How long will he delay—By G. H. Baker.

• You can expect some unions to start some very quiet internal housekeeping as a result of the union scandals now being aired in the Congress.

Senate investigators plan to expose only the worst examples of union mismanagement in the current public hearings. They point out that they have reluctantly swung the spotlight of publicity on Dave Beck and certain Teamster officials after earlier hopes for a housecleaning from within the union failed.

Or Else — There's to be no attempt in the current hearings to expose every example of irregularities within unions. But the Senate probers expect that all unions not directly involved in the current investigation will move quietly to put their houses in order.

It's known, for example, to the Senate investigators that many bookies and numbers writers operate within some big plants with the silent approval of union officials. In some cases, shop stewards are suspected of being active operators in the horse and numbers rackets.

Who's Laughing — Up to now, top union officials have shrugged off management's complaints

against these practices. Union officials have not been overly interested in stopping what they smilingly refer to as "a little innocent amusement." Now, the situation is changing. The heat being generated in Senator McClellan's investigating committee is causing some unions to take a second look at these questionable practices.

It's interesting to note that mail being received in the Senate and in the House on the subject of union racketeering is running heavily in favor of the current investigations. Many letters are signed only "Union Member," to avoid possible reprisals. Only a small percentage protests the inquiry.

Tan Not Deductible

Midwinter sun tans are not deductible for income tax purposes, the Internal Revenue Service says.

The IRS says "reconditioning" of executives on Florida beaches is plain old "living expenses," and clearly not medical expenses. As a result, you cannot deduct the cost of lazing about on Florida sands, hotel publicity to the contrary.

Does Dave Beck Dare Come Home?

The government took a step to cut short the European travels of Teamster President Dave Deck.

A Senate committee has asked Beck to appear before it and tell how the Teamsters spend their money. Beck has refused, giving as his excuse several "appointments" in Europe, including the International Labor Organization (ILO) Transportation conference in Hamburg, Germany.

NAME CROSSED OUT

Secretary of Labor Mitchell therefore omitted to name Beck as U. S. delegate to the ILO meeting in Hamburg. And Mitchell has asked AFL-CIO President Meany to recommend another delegate for the ILO meeting.

Result: Beck's list of "reasons"

for remaining outside the U. S. is dwindling fast. In Senate corridors, there's talk that Beck may never return to the U. S., or that he may remain away for a year or two until the McClellan investigation blows over.

DAVE STANDS MUTE

Meanwhile, the Teamster head maintained a mute attitude in Europe. His message in the March issue of the union publication makes no mention of the difficulties (if he considers them such) that he and other Teamster officials find themselves in.

The publication says Beck will return as soon as his commitments at the conference and with other labor groups in Europe are concluded.



add Bearings, Inc. engineering service to a good idea . . . get a better product!

A prominent manufacturer of electrical motors uses 110 of these flyer assembly spindles to wrap insulating wire. They worked fine — much better than old type spindles but the life of the bearings averaged only one to two weeks per unit. This caused serious delays in production and an excessive bearing replacement cost.

Bearings, Inc. engineers were given the problem. All spindles were shipped to our complete Spindle Repair Department in Cleveland. The housings and shafts were reworked to accommodate a machine tool precision bearing with proper clearances and preloads to meet the most rigorous service demands.

Within a short time these spindles were back in service, operating at higher speeds than had been possible before. They wind evenly with uniform tension, wire breakage is eliminated and the bearings are giving exceptional service life.

Do you have a bearing problem? Want replacement bearings in a hurry? Ask our branch nearest you for any service involving bearings — they're ready NOW to help you!

Rendering bearing service in the territories adjacent to our branches, listed below.

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria
• Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Fit Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • MARYLAND: Baltimore
DELAWARE: Wilmington •

Subsidiaries: Balantol Corp. • Buttalo, N. Y. •
Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

Will Hawaii Get A Steel Mill?

The Odds Are Long-But Narrowing

Having a local source of production looks attractive to the Islanders.

Right now they're paying about \$25 to bring in a ton of reinforcing rod.

However, investors will take a long look before setting up shop.

—By R. R. Kay.

• Will Hawaii get a steel mill? There's been a lot of speculation about it recently.

THE IRON AGE can now report that it's a long way off. Why? Nobody has come up with a real appraisal as to whether a mill will pay. And it will take a thorough study by a top engineering firm to find out.

For Hawaiian businessmen the No. 1 attraction of a local steel mill is, of course, savings in freight. It costs about \$25 to bring in a ton of reinforcing rod. What's more a local producer would have a good hold on his customers.

Get the Facts — But is this enough of a basis for setting up shop? Before any investor puts up a mill, he must have at least an accurate forecast of future steel consumption by type of product. Also important is knowing how much local scrap will be around, and how much it will cost.

In Honolulu, Rollin C. Bacher, director, Industrial Development Section, Hawaiian Electric Co., Ltd., says his company made a study on "The Potentialities for a Small Steel Mill." He'll be glad to send a copy of it to readers.

The Power — There's plenty of power in the Honolulu harbor area for an electric furnace of modest



FIRST BY A NOSE: Moving from its jig to the head of the production line is nose section of first new Boeing commercial jet transport. The 600-mph plane has already been purchased by eleven major airlines. First production models will be delivered in 1958.

size. Scrap dealers there say the Islands generate some 40,000 tons of scrap per year—half of it suitable for electric furnace use.

There are persistent rumors in Honolulu that Kaiser Steel Corp., Oakland, Calif., will build a small semi-integrated steel mill there. But THE IRON AGE has word from topside that if a mill is put up, it won't be by Kaiser. However, several mainland companies are looking over the field.

The Market — The construction industry in Honolulu is going great

guns. Some \$300 million will be spent in the next two years. Local demand for steel should remain strong for a long time. Schools, hotels, roads, tunnels, bridges, industrial buildings, and military facilities gobble up lots of steel.

Best estimates on the Hawaiian market: 10,000 tons per year of reinforcing rod and 3000 tons to 5000 tons more for Guam. Hawaii's instock sizes range from ½ in. to 1½ in. Small angles are in demand. And it's believed there's a market for a 10-in bar mill.

STRIPPING ENAMEL...

SAVING TIME





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15 SECONDS . . . WRINKLING TAKES PLACE!



25 SECONDS . . . STRIPPING COMPLETED!

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For the right strippers to solve your organic stripping problems fill out a questionnaire we'll send at your request; return it with typical samples of your work. Enthonics will find the answer... without obligation!

And ask for your copy of the "Enthone Check List" of literature covering more than 60 products and processes developed for modern electroplating and metal finishing.

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* The Scientific Solution of Metal Finishing Problems

1957 Sales Off to a Good Start

Builders Clear Tight Money Hurdles

If you need financing badly enough and are willing to work, you can get it.

Or so the pace being set by machine tool builders seems to indicate.

It's no secret why they're pulling ahead while other industries lag behind.—By E. J. Egan, Jr.

• "Despite tight money and scattered talk of let-downs in some industries, the fact remains that overall machine tool distributor volume thus far in 1957 is good."

That's the word members of the American Machine Tool Distributors' Assn. got from their president, Joseph F. Owens, Jr., at the trade group's spring meeting in Palm Springs, Calif. last week.

Spot Check Proof—He bolstered this statement with the prediction that 1957 shipments of machine tools sold through distributors will at least maintain 1956 levels. And, according to Owens, "Shipments will increase from 5 to a conservative 15 pct in those areas where continued expansion is going to call for newer, more efficient and more productive machine tools."

He told members that the Association spot checked new order rates in some areas just prior to the meeting. Results showed gains of 10 to 50 pct over the first two months of last year in metropolitan New York, the South, and most of the Midwest, Southwest and Pacific Northwest.

Pushing Sales—Distributors and their customers are finding money a bit tighter though. A nationwide quiz of AMTDA member firms shows 70 pct reporting less money available in their areas than last year. The remaining 30 pct say the supply is about the same.

On the whole, however, distributors are able to find needed capital to help their customers buy, and at acceptable terms. And they're working hard to boost machine tool sales wherever possible, tight money notwithstanding. Nearly 70 pct of AMTDA members plan to add ad-

ditional sales engineering or service personnel this year.

Most distributors have plans for keeping both old and new staff members busy. There's a decided trend toward greater use of market research techniques to smoke out sales prospects.

Part of the overall market research problem concerns ways and means to cope with changes in buying methods or patterns. As customers expand and diversify, spread out into branch plants and divisions, the number of influential buying contacts is multiplied accordingly.

GEAR INDEX 1956/57

Base 1947-49 -- 100

July	286.7
August	219.5
September	230.5
October	299.8
November	216.2
December 1956	235.7
January 1957	259.3

Source: American Gear Manufacturers Assn.

Eisenhower Helps India Tool Up

As part of its foreign aid program, the Eisenhower administration is considering ways to help India expand its machine tool production.

India now has about 17 machine tool plants, including two that are government-owned. All told, they supply only about 20 pct of the nation's current need.

Feelers Out—By 1960-61, India wants to produce an annual volume of equipment valued at \$20 million.

The nation's metalworking firms now operate approximately 80,000 machine tools, but 170,000 units will be needed five years hence.

At a recent Washington meeting, Dept. of Commerce and International Cooperation Administration officials sounded out U. S. builders for their views. One question: Would American firms consider setting up technological, licensing, or investment arrangements with Indian private enterprise on a mutual profit basis?

Mission Proposed—Government spokesmen explained that, in proportion to any such deals that could be worked out, the amount of dollar aid to India in the form of loans or grants could be reduced.

Builders wouldn't commit themselves to this extent. Some did say that if the Government requested it, they would lend industry experts to serve on an exploratory mission to India. Its purpose: to survey that nation's potential for boosting its machine tool output.

INDUSTRIAL BRIEFS

Safer Than at Home—Worcester Pressed Steel Co. had its best safety record during 1956. Presteel had one lost-time accident last year for nearly 500,000 man hours of work. This is a frequency rate of only 2.03. Comparisons show the National Safety Council frequency for stamping work to be 11. The Pressed Metal Institute frequency for the industry as a whole was 16.94.

Change of Scene — Pittsburgh Standard Conduit will build a new plant in Verona and discontinue its Etna operations. Completion is scheduled for late Fall of 1957. Operations will begin early in 1958.

Tough Target—A new Air Force contract, in excess of \$10 million, for several hundred additional Firebee jet target drones, has been received by Ryan Aeronautical Co. An advanced model of the Ryan Firebee set new records in flights soaring to 53,000 feet altitude and flying for one hour and 44½ minutes. Other jets have flown under remote control at distances of 152 miles from a control station.

Study in Motion—A motion and time study intensive course will be offered by the Dept. of Industrial Engineering and University College of Washington University in St. Louis. Scheduled for June 5-14, the course is intended to help prepare the attendee to apply motion and time study in his own organization and to train others in his company.

Search for Research—Townsend Co. has acquired G. O. Noville & Associates, Inc., a research and development organization in Santa Monica, Calif. Acquisition was made through an exchange of stock. Noville is the second company Townsend has purchased in the last six months as part of its expansion and diversification program.

Soak and Roll—Salem-Brosius, Inc. will install two 3-hole rectangular soaking pits with recuperators at the Midland, Pa. works of Crucible Steel Co. of America. They will have a rated capacity of 288,000 tons per year. The company also has an order for a roller hearth type furnace for installation at Kaiser Aluminum's new rolling mills in Ravenswood, W. Va.

Sud American Subsidiary — A wholly-owned subsidiary has been established in Venezuela, by Mine Safety Appliances Co., producer of safety equipment. The new firm will handle sales and service with Walco S.A., a Venezuelan corporation. Three warehouses will be operated by MSA at Caracas, Maracaibo and Puerto La Cruz.

No Quarter for Porter—A modern industrial plant will be erected in Tennessee by H. K. Porter Co. A mong manufactured products there will be switchgear, protective devices and transformers. The plant is expected to be completed in mid-1958. Porter has also entered the chemical field and is constructing a plant in Pascagoula, Miss.

Coked Up—United States Pipe and Foundry Co. has awarded Kopper's Co., Inc., a contract to design and erect a battery of 80 coke ovens at its Birmingham, Ala., operations. The new battery will be the Koppers type gun flue ovens with certain auxiliary equipment. Coke oven capacity is expected to be increased approximately 30 pct.

It's Titanic—Titan Metal Manufacturing Co. has purchased a new 1500 ton Sutton extrusion press from Sutton Engineering Co. Pittsburgh. It will be installed at Titan's new West Div. plant at Newark, Calif., for the extrusion of brass and copper. The press will operate by a self-contained oil hydraulic power system.

Give Him a Hand—A. M. Luntz, president, Luntz Iron and Steel Co., Cleveland, O., has received the National Human Relations Award of the National Conference of Christians and Jews. Presentation was made on Feb. 24 by Dr. Everett R. Clinchy, National Conference president.

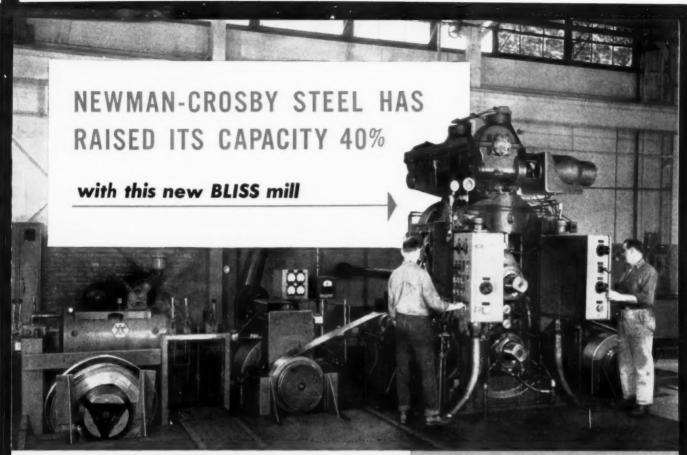
Look, No Hands—An electronic brain controlling ordering, stocking, and production of GE distribution transformers has been developed by General Electric Co. The new system uses tape, punched cards, and an electronic brain to link the company's transformer factories with 51 district warehouses throughout the country.

High Sierra—Sierra Drawn Steel Corp., Los Angeles, will expand its Seattle production facilities for cold-finished bars. A 4000-sq-ft addition will make available more specialty steels for Pacific Northwest makers of machinery, power transmission shafts, and tools.

First and Only—The nation's first and only independent commercial computing center equipped with an IBM 704 electronic data processing system, has been opened in Arlington, Va., by Council for Economic and Industry Research.



"Would you care to join my expense account for lunch?"



ike many another metal producer, Newman-Crosby Steel Company is betting confidently on the continued healthy growth of the American economy! This Rhode Island producer of close-gage cold rolled strip has just raised its capacity a good 40% by installing a new Bliss 4-high reversing mill, as well as new coil-handling and heat-treating facilities.

The $6!2^{\prime\prime\prime}$ and $16^{\prime\prime\prime}$ x $14^{\prime\prime\prime}$ mill is used to roll high-carbon and alloy spring steel in gages between $0.125^{\prime\prime\prime}$ and $0.010^{\prime\prime\prime}$, in widths up to $12^{\prime\prime\prime}$ and at speeds to 800 fpm. In actual operation all these design specifications have been exceeded. Bliss also designed and built the coil-handling facilities, including the two tension reels and coil buggies and the pay-off reel. Maximum limit on coil weight is 6,000 pounds.

An unusual roll drive arrangement permits wide flexibility in the choice of roll diameter. Roll speeds are synchronized electrically rather than through gears. Thus, even unmatched roll diameters can be used together successfully.

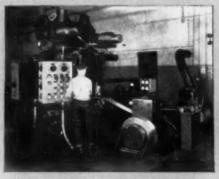
Building mill equipment to meet special needs...or to perform standard operations more efficiently... is an important reason why Bliss has become a leader in the field. If you would like more information on Bliss mill innovations, as well as details of many Bliss installations, write us today for a copy of our 60-page Rolling Mill Brochure, Catalog 40-A.

E. W. BLISS COMPANY

General Office: Canton, Ohio ROLLING MILL DIVISION SALEM, OHIO

BLISS SINCE 1857

is more than a name... it's a guarantee The new mill has already outperformed most of the specifications set for it, rolling strip thinner, wider and faster than its original objectives of 0.010-inch gage, 12-inch width and 800 fpm speed.



Another view of the unusual new mill. Elimination of geared roll drive adapts it to use with wide variety of roll diameters to suit different rolling problems.

PLANTS: Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Pittsburgh and Midland, Pennsylvania; San Jose, California, In Europe: E. W. Bliss (England) Ltd., Derby; E. W. Bliss (Paris), France.

shaping metal for all industry

Ohio Iron and Steel Rolls

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Special Iron Rolls

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Forged Steel Rolls



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio



Bertram A. Kline, elected asst. vice president and sales manager. Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.



Robert C. LeMay, named director, Contract Research Sales Div., Selas Corp. of America, Dresher, Pa.



Earl A. Frazier, appointed New York district sales manager, Wire Rope and Aircord Div., John A. Roebling's Sons Corp., New York.

John O. Lorange, elected vice president, blast furnace operations, E. J. Lavino & Co., Philadelphia; Lawrence C. Steele, elected asst. vice president, blast furnace operations.



John M. West, elected vice president, General Nuclear Engineering Corp., Dunedin, Fla.

D. R. Mathews, named general superintendent, primary production, Alan Wood Steel Co., Conshohocken, Pa.

M. O. Gustafson, named marketing vice president, Lumber Fabricators, Inc., Fort Payne, Ala. Cyrus Hough, elected vice president, engineering, Bellevue Industrial Furnace Co., Detroit.

Ralph D. Williams, elected vice president and William R. Whitener, named sales manager, Lake Asbestos of Quebec Ltd., subsidiary of American Smelting and Refining Co.

D. S. Harder, elected executive vice president, Ford Motor Co., Dearborn, Mich.

John F. Torley, named general superintendent, Capitol Foundry Div., National Malleable & Steel Castings Co., Phoenix, Arizona.

J. Edwin Hanson, elected controller, Reed-Prentice Corp., Worcester, Mass.

James S. Hurlburt, named manager, Materials Div.'s Southwestern district, General Electric Co., Bridgeport, Conn.

F. W. Hanson, named Houston district manager, Electro Metallurgical Co., Div of Union Carbide and Carbon Corp. L. G. Wood, named district sales manager, New York, United Air Lines; Arthur Fairbanks, named district sales manager, Boston.

John R. McDonald, named manager, small screw sales, The Lamson & Sessions Co., Cleveland; Robert G. Patterson, Jr., named manager, distributor sales.



John L. Rose, named works controller, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Following appointments are within Republic Steel Corp.'s Cleveland steel plant. J. Eric Heyworth, named asst. superintendent, Me-





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Air-Grip Clutches Technical date, sizes and selection tables. Bulletin A634

Chain Couplings, Taper-Lock
Sprockets and Dadge Roller
Chains. Technical deta and selection methods. Builtein A&44

Sealed-Life V-Belts. Construction details and complete date on sizes, pitch lengths and autside lengths. Bulletin A606

Write for your copies.

DODGE MANUFACTURING CORPORATION
800 Union Street • Mishawaka, Indiana

DODGE

chanical Dept; Thomas P. Arbogast, named asst. superintendent, strip mill Mechanical Dept; Richard P. Schrift, named asst. superintendent, inspection and conditioning.



Dr. William Reed, named director, nuclear energy applications, Republic Steel Corp.

Charles M. Kearns, Jr., named asst. general manager and William E. Diefenderfer, named engineering manager, Hamilton Standard Div., United Aircraft Corp.

Clee O. Worden, named manager, tool steel sales, Edgcomb Steel Co., Philadelphia.

Walter Donner, named asst. director, research and engineering, laboratory instrumentation, Scientific Instruments Div., Beckman Instruments, Inc.



Leonard R. Stone, named director, Nucleonics Dept., Republic Steel Corp.

William A. Nairne, named manager, buff sales, Hanson-Van Winkle-Munning Co., Matawan, N. J.

Dr. Bernard J. Gaffney, named New York manager, The Rust Engineering Co., Pittsburgh.

Ralph A. Maggio, named staff statistician, Jones & Laughlin Steel Corp.

Captain Robert T. Simpson, USNR, appointed senior product planner, Medium Steam Turbine, Generator and Gear Dept., General Electric Co., Lynn, Mass.

Thomas F. Gallagher, appointed district sales manager, Chicago, Laclede-Christy Div., H. K. Porter Co., Inc., St. Louis.



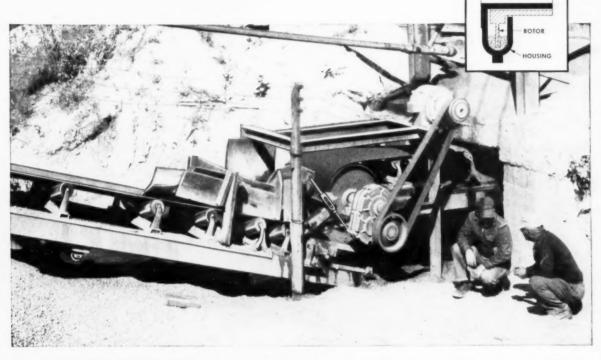
Dan C. Kline, named erecting manager, American Bridge Div., U. S. Steel Corp., Roanoke, Va.

R. W. Wilson, appointed Chicago district manager, Electro Metallurgical Co.

Nicholas J. Bouras, named manager, Reinforcing Bar Div., U. S. Steel Supply Div., U. S. Steel Corp., Newark, N. J.

The following have been appointed to positions in the magnetic materials section of General Electric's Metallurgical Products Dept., Edmore, Mich. R. J. Studders, named manager, engineering; Max E. Hartl, named manager, market-

This new drive
starts loads smoothly...
with smaller motors
...and gives 100% efficiency
at full load!



FLEXIDYNE THE DRY FLUID DRIVE

This tunnel conveyor, 225 feet long, handles 500 tons of sand and gravel per hour—8 to 16 hours a day.

With Flexidyne, the motor picks up the load easily and smoothly. Power investment is reduced, power costs cut, maintenance simplified and conveyor belts are protected against breakage.

Flexidyne, the Dry Fluid Drive, is the new development that starts loads smoothly, that protects against shocks and overloads, that saves power and that gives 100% efficiency at full load!

The "dry fluid" in Flexidyne is heat treated steel shot. A measured amount, called the flow charge, is contained in the housing, which is keyed to the motor shaft. When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, wedging it between the housing and the rotor which transmits power to the load.

After a momentary slip between housing and rotor, the two become locked together and achieve full load speed without slip and at 100% efficiency during the running cycle. Changes in weather—hot or cold—inside or out—do not affect operation of Flexidyne.

Flexidyne is now available in 8 sizes—for use with electric motors and internal combustion engines from 1 hp to 300 hp. While each size is power rated, the flow charge can be varied at will to give tailormade torque for your particular job. Write for Bulletin A-640.

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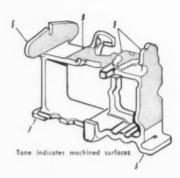


CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, coat-saving methods. Look for his name under "Power Transmission Machinery" in jour classified phone book, or write us.





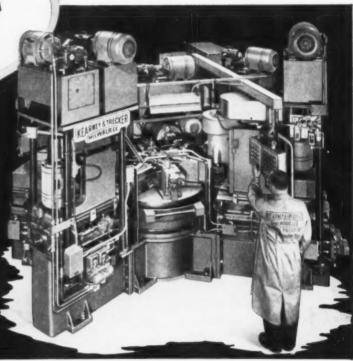
One of the nation's leading manufacturers of communications equipment needed a way to increase production milling of telephone relay frames, reduce unit costs and greatly improve product quality. They called on Kearney & Trecker to solve this problem.



KEARNEY & TRECKER MILWAUKEE OF DESIGNED

Here's Kearney & Trecker's answer: Two 6-Station Rotary Indexing machines which mill 24 surfaces on cast iron telephone relay frames within plus or minus .002" at a combined rate of 360 pieces per hour. Former methods produced only 150 relay frames per hour.

An important cost-saving feature of each machine is the application of standard units — five feed slides and a 48" rotary index table. Such utilization of standard units lowered initial costs, simplified maintenance and increased efficiency.



High-volume, low-cost production starts with Kearney & Trecker Milwaukee machine tools

Kearney & Trecker automatic production machines accurately perform many operations at lower cost. But most important to you, this is accomplished by combining standard design components—feed slides, way-type drill units, tapping units, quill feed units, rotary index tables—that keep initial machine costs at a minimum. You get the production you want and the econ-

omies you need from job-proven designs. What's more, you get performance to exacting accuracies.

Take advantage of our abilities. See how they can pay off in new profits for you. Whatever your production machine needs, call our representative or write: Special Machinery Division, Kearney & Trecker Corp., 6792 W. National Ave., Milwaukee 14, Wisconsin.

For more information on machine illustrated, ask for Data Sheet No. 1083. A new bulletin, SMD-56, which describes many of our outstanding machine designs, is also yours for the asking.





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ST. LOUIS, MO. Blackman & Nuetzel Machinery Co. 3713 Washington Ave.

ST. PAUL, MINN. Sales Serv. Mach. Tool Co. 2363 University Ave.

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SAN FRANCISCO, CAL. Moore Machinery Co. 7th & Carleton-Berkeley

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SEATTLE, WASH. Dawson Mach. Co. 5700 First Ave., S.

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WICHITA, KAN. White Star Mach. Co. 301 N. St. Francis

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ing; Anthony J. Gizzi, named manager, specialty resistor project; Joseph M. Scott, named manager, finance.

Kenneth B. Valentine, named metallurgical engineer, Pontiac Motor Div., General Motors.

Charles L. Zoltani, named chief engineer, Special Machinery Div., The Teller Co., Butler, Pa.

Richard A. Matthews, named project engineer, Samuel Moore & Co., Mantua, O.

William J. Laughlin, named Los Angeles branch manager, Thor Power Tool Co.



Harold M. Cherry, elected president, George L. Nankervis Co., Detroit.

Paul B. Hoffman, named manager, Purchasing Administration Dept., Ford Motor Co., Dearborn, Mich.

James E. Hovis, named manager. Industrial Furnace Div., The Gas Machinery Co., Cleveland.

Jack Grant, appointed administrative asst. to president, Pennsylvania Engineering Corp., New Castle, Pa.

Leroy E. Bonnette, named chief engineer and Carl W. Lindahl, named director, purchasing, Denison Engineering Div., American Brake Shoe Co., Columbus, O.



E. W. Ruhe, appointed roll-bond manager, Western Brass Mills Div., Olin Mathieson Chemical Corp., New York.

E. H. Sangwine, named manager, alumina and caustic chlorine production facilities, Kaiser Aluminum & Chemical Corp., Gramercy, La; Walter H. Bast, named works manager, reduction plant, Chalmette, La.

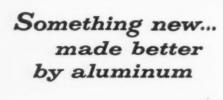
Arthur E. Ackerman, named general sales manager, Millers Falls Co., Greenfield, Mass.



Norman Gardner, appointed purchasing agent, Barnes-Gibson-Raymond Div., **Associated Spring Corp.**, Plymouth, Mich.

John Michelotti, named director, purchases, Clearing Machine Corp., Div. of U. S. Industries, Inc.

W. E. Clark, Jr., named sales representative, Pittsburgh, The L. S. Starrett Co., Athol, Mass; J. R.



Aluminum "sail" of atomic sub breaks water as ship surfaces. "Sail" is the protective sheathing around superstructure and controls.

New alloys make aluminum a seagoing metal

The new atom-powered submarines "Nautilus" and "Seawolf" offer dramatic proof that aluminum can be just as much at home in salt water as on dry land. Both of these modern vessels are equipped with streamlined aluminum sheathing above decks to reduce topside weight. Other interesting marine uses of aluminum include a speedy new Canadian subchaser, the superstructure of passenger ships like the new Norwegian liner *Bergensfjord* and the S. S. United States and hundreds of different types of pleasure craft.

Key to the use of aluminum in many of these

marine applications is the development of special alloys and welding techniques by Aluminium Limited research.

With these problems solved, aluminum fabricators are sure to find larger markets in the shipbuilding field.

Through research, new and different uses for aluminum are broadening fabricators' markets everywhere. To help assure a dependable supply of primary metal for independent fabricators, Aluminium Limited is investing \$3,000,000 a week in additional production facilities.

Supplying U.S. Industries with primary aluminum from Canada

Aluminium Limited Sales, Inc.

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CLEVELAND . CHICAGO . DETROIT . LOS ANGELES . BUENOS AIRES . SÃO PAULO

Boehm, appointed sales representative, Western New England; R. S. Lougee, named sales representative, Western New England.

Thomas G. Kuzma, appointed Detroit district manager, sales, Rotary Electric Steel Co.

Roy E. Hess, named New York district manager, Transue & Williams Steel Forging Corp; Bruce Thompson, named asst. to manager, Transue Forging Sales Div; Bruce Wiegel, named asst. to manager, Stamping Sales Div.

Richard A. Geuder, named general manager, marketing, Reliance Electric and Engineering Co., Cleveland; Carl V. Gregory, named sales manager.



J. II. Richard, named asst. manager, General Order Dept., Republic Steel Corp.

Christopher P. Blakeley, appointed chemical products engineer, Boiler Chemical Sales Dept., Hagan Chemicals & Controls, Inc., Pittsburgh.

Edward G. Lommel, named plant engineer, Detroit Transmission Div., General Motors, Ypsilanti, Mich.

Walter J. Mollenauer and William P. Youngquist, appointed asst. sales managers, Vulcan Crucible Steel Div., H. K. Porter Co., Inc., Aliquippa, Pa.

Stephen Smith, appointed manager, Sales Service Dept., Norton Co., Worcester, Mass.

Lynn F. Jorgenson, named Chicago sales manager and manager, sales training program, Rolled Steel Corp., Skokie, Ill.

K. Jerry Morray, appointed manager, Cleveland sales district, Silicone Products Dept., General Electric Co., Waterford, N. Y.

OBITUARIES

B. A. Miller, 55, vice president and general manager, Crown Non-Ferrous Foundry, Inc., Chester, Pa.

George E. Williams, 68, chief engineer, Forging Div., Transue & Williams Steel Forging Corp.

Hans Wickstrom, 86, retired sales representative, Grinding Machine Div., Norton Co., Worcester, Mass.



Open Hearth Furnaces—Photo Courtesy Jones & Laughlin Steel Corp.

Soaking Pit—Photo Courtesy



Continuous Heating Furnaces— Photo Courtesy Crucible Steel Co.



Heat Treating Furnace—
Photo Courtesy Taylor Forge & Pipe Works



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For years Loftus Industrial Furnaces have been providing dependable, economical service to the steel industry. Their long life and efficient performance have been proved by time. The fact that they materially contribute to lower-cost operation and increased production is a matter of record.

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ments, it will pay you to take advantage of Loftus'long experience in furnace design and construction. Many of the world's leading companies have—and to their utmost satisfaction, as proved by the high percentage of repeat orders we get.

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The Impossible doesn't take as long

Impossible to convert an automated transfer-feed line? Not even difficult when it's a Clearing Transflex line. In fact, the whole automated setup can be converted from producing one part to another in about half an hour. The Clearing automated line above is equipped with a feed where the fingers on the feed bars can be adjusted, or faster still, replaced with a different set of bars pre-set for the

next job. The presses also have moving bolsters. Dies for the next run are set up outside the press while the presses are operating. When the run is completed, the new dies are powered into place at the touch of a button.

Think of it! An entire automated line ready to go on the next production run in about 30 minutes. That's not all. These presses are equipped

CLEARING PRESSES

CLEARING MACHINE CORPORATION Division of U. S. INDUSTRIES, Inc.



as you might think!

with removable feed units. Consequently, part of the press line can be operated manually by simply rolling the feed units—they're on wheels—to one side. The last press in the line shown above is on manual operation. The first three are being readied for an automated, hands-off setup. Yes, the impossible is standard operating procedure with a Clearing Transflex line.

One modification of the Transflex line shown in the large illustration offers the benefits of automated production at a relatively moderate cost. This line has the same basic removable feed mechanism as shown above adapted to medium capacity machines. Feeds may be wheeled anywhere in the shap to automate other press lines.

Here then is automation so flexible that even a job stamping shop with requirements for many different parts can plan to automate some of its stamping production. There are many different Transflex ideas that Clearing engineers can discuss with you. Get in touch with us. There'll be

no obligation.



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We've discovered

PART OF AMERICA'S FUTURE

underground in Tennessee



As the American economy has expanded, the use of zinc by industry has greatly accelerated, until today's per capita consumption of zinc shows a giant 24% increase over the per capita consumption only seven years ago.

But what about the future? With zinc's importance to Industry's ever-increasing demands, what about the supply?

In recent months, American Zinc has discovered a part of America's industrial future... underground in Tennessee. In the East Tennessee area, mining properties which adjoin American Zinc's long-established Mascot, Tenn., mining operations, exploration and development have confirmed zinc ore reserves underground which are equivalent to more than 75 years' production at the current rate of mines now operating in this area.

Tomorrow's zinc for automobile grills and trim...the galvanized coatings for steel...zinc for die-castings and brass... zinc pigments for paints and rubber...now lies underground in American Zinc's Tennessee development.



inc, lead & smelting company

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How To Tap The Atomic Energy Market

This article is not written for or about companies who are in the nuclear end of the atomic energy business.

But it does show how companies who make bearings and machine tools, furnaces and pumps, are moving into atomic energy.

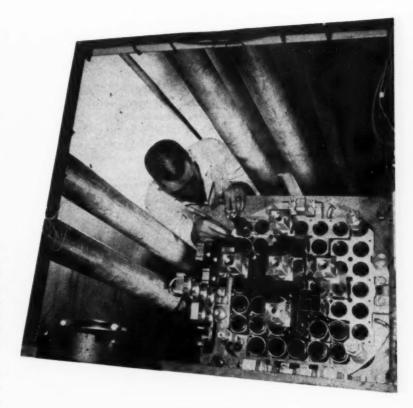
It tells why it may pay you to look into this field and how to go about it.

■ The fact that your company is not interested in atomic energy should not blind you to its market possibilities. Many progressive companies in all branches of metal-working are looking into the field right now. They are doing it through a relatively new device, the Access Permit.

You may feel that the field is too big, too complicated. Yet important areas of it are now open to companies who know nothing about atomic energy and never expect to. These firms do not make reactors or turbines, geiger counters or beta-ray gages. But they do want to supply "hardware" to the Atomic Energy Commission or its contractors

They include companies whose products range from machine tools to bearings, from pumps to furnaces. About a hundred companies whose products at first glance might not seem to apply to atomic energy have secured access permits from the AEC. Many of them are finding this approach well worth while. Others have found that the market looks promising.

Look at Market-In units it



shapes up like this: During 1956 the private atomic industry booked orders for or began building 59 reactors, 30 of them research and test reactors, 29 power-type. And it was working on 17 previously ordered. A research reactor costs between \$750,000 and \$4 million, not including supporting laboratory facilities. A power reactor costs from \$50 to \$100 million, including research and development.

Dr. Chauncy Starr, North American Aviation vice-president, made a dollar estimate last month. He figures total world sales of atomic power plants during the 10 years 1956-1965 at about \$6 billion. Deducting units which will be built abroad cuts that figure to \$4 billion.

PACKAGE POWER: Reactor core for U. S. Army, Ft. Belvoir, shows fuel elements and control rods. Alco Products, Inc., Photo

About a fourth of this will be in atomic equipment itself: nuclear reactors, special handling equipment and special heat exchangers. This leaves a \$3-billion U. S. sales estimate for the non-nuclear end of the business: turbines, generators, pumps, piping, and allied equipment.

So the area of interest for nonnuclear metalworking companies and possibly your company—is some part of this \$3 billion over the next 10 years. For the decade following 1965 Dr. Starr estimates

Are AEC Access Permits Worthwhile?

E. M. Zuckert, Consultant, Washington.*

Normal management foresight makes an access permit a "must" for any company determined to keep a breast of developments



and techniques affecting metals.

The speed and success of the program for obtaining power from atomic reactors depends mainly on solving the diversity of problems relating to metals. Radiation, corrosion and ability to withstand even higher temperatures are among the most conspicuous examples of these problems.

The impetus behind the atomic energy program is resulting in a forced-draft research and development effort upon a great number of problems in the field of metals and metallurgy. New alloys such as those using the rare earths; the use of relatively unfamiliar metals like zirconium, niobium and thorium; and new techniques of welding, casting, rolling, cladding, etc., are being developed for atomic energy. This will bring advances not only in that field but perhaps

even more importantly in other areas where requirements now demand improved metal performance.

The AEC's Access Permit device gives companies outside the program an opportunity for a reasonably systematic look at the developments bearing most closely upon their own interests. AEC is now trying to declassify and publish the mountains of significant research material arising from its own program.

But the access permit will be useful for the considerable time it will take to dissipate the secrecy barriers and develop a normal distribution of this type of information.

*Mr. Zuckert is a former AEC Commissioner.

W. K. Lombard, vice-president, Thermal Research & Engineering Co., Conshohocken, Pa.

We secured an access permit because of our interest in heat transfer. The AEC has three of our fuel-fired heat exchangers at the National



Reactor Testing Station in Idaho. It's one thing to sell these things; it's another to find out how they're being used. We wanted our engineers to be able to see how the units are used; we should be able to improve our designs if we can see them in actual operation.

Another thing, the AEC uses a lot of process heat and we think they may be able to use some of our combustion equipment. But until we can see just where they

use it, the conditions and temperatures, etc., we can't make an intelligent proposition.

We're not looking for a research and development contract right now, we have enough of our commercial work in the lab. We'd prefer to sell or modify some of our present designs. But, from our AEC work we expect to learn things that will be useful for other industrial applications of our various products.

Continued from page 127

this figure at about \$16.5 billion.

In the fiscal year which begins next July, AEC itself will spend a record \$2.5 billion. There is, of course, some overlap here.

In addition to sales of actual products there are interesting possibilities in research and development work for AEC. It is needed in such fields as heat exchangers, direct transfer of heat for industrial use, welding, brazing and joining plus a great deal of metallurgical work.

Where to Start—Conceding that the market is important now and growing rapidly, just what sort of products are needed? To find out if your products can fit into the picture here are some of the first steps to take:

(1) Get a copy of "Selling to AEC" from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. (25¢).

(2) Read "A Businessman Asks: How Can I Keep Up With Atomic Energy Developments?" from Technical Information Service, Atomic Energy Commission, Washington 25, D. C. (Free).

(3) Attend conferences or expositions on nuclear energy. They are held at various times during the year. (Examples: The Nuclear

Congress now being held in Philadelphia; the annual atomic energy conference of the National Industrial Conference Board, also being held this week in Philadelphia; one of the frequent conferences of the American Management Assn. The next is April 10-12 in New York; the annual exposition sponsored by Atomic Industrial Forum, New York, Oct. 27-Nov. 1; a conference on Nondestructive Tests in Nuclear Energy, Chicago, April 16-18).

(4) Consider sending an executive to the April 1-6 Atomic Energy Course for Management produced by the National Industrial Confer-

Continued on Page 130

R. C. LeMay, Director,

Contract Research Sales Div., Selas Corp. of America, Dresher, Pennsylvania.

We received an access permit last summer and got "Q" clearances for some of our engineers so we could follow-through on the use of our



equipment at AEC plants. So it is logical to assume that we may be

able to improve the processes where, for example, some of our "settings" (10-ft. diam. kettle heating units) are being used.

Recently we've been down to Oak Ridge — one of the largest factories in the world—and found numerous applications for heating equipment there. We also discovered that people at Oak Ridge and at other AEC facilities are eager to learn about and to use the latest developments. They want practical industrial know - how; they may ask us to apply our know-how and to teach other people.

Actually one of our major objectives-we have quite a fine new laboratory here—was to secure research and development contracts which will both use our experience and facilities and keep us abreast of atomic energy developments. One such development requires the brazing of high temperature heat exchangers with alloys which are difficult to work with. We know something about them, but still have much to learn. We think that the AEC will be interested in a research and development contract on this type of work.

D. E. Stokes, Manager,Market Development,F. J. Stokes Corp., Philadelphia.

The use and processing of radioactive materials will become such an important part of the industrial scene that no forward-looking



company can afford to ignore it in the years ahead. We are manufacturers of high vacuum equipment. So, in the case of our company, the nuclear energy industry is important to us since high vacuum equipment is used to process and salvage nuclear fuels.

It stands to reason that as the nuclear energy industry grows, so will grow the industry's need for high vacuum equipment.

High vacuum equipment has been extensively used in many of the government's atomic energy facilities. With the free interchange of non-classified material, the fund of technical experience existing in the Atomic Energy Commission is of direct benefit to companies such as ourselves. Conversely we often find we can contribute some of our own experience to AEC people con-

cerned with vacuum technology.

Although we have held an access permit for only a relatively short time, it has definitely helped us to keep in touch with the latest developments in application of high vacuum to nuclear fuel processing. We plan to visit AEC installations for deeper review of current practices and equipment relating to high vacuum technology.

I suspect few people realize how easy it is to get an access permit for such purposes. We were certainly pleasantly surprised and have since been gratified at the ready cooperation received from the AEC.

E. R. Trapnell, Director, Nuclear Energy Div., Bozell & Jacobs, Inc.* Washington.

The Atomic Energy Commission's program for controlled, but not very limited, access to "classified" technical information on



the peacetime applications of nuclear energy is contrary to the spirit of the Atomic Energy Act of 1954 and the tradition of American free enterprise.

It is acceptable only as an interim measure to ease the Commission's problem in changing from a situation of government monopoly in nuclear production and use to a situation framed to encourage private investment and industrial initiative.

Fortunately, it appears that AEC recognizes these hazards of the access permits program. AEC shows a growing determination to overcome the need for such a program by progressive declassification of technical information.

Industry must continue to press for declassification and support the announced policies of AEC to make information available fully and freely as rapidly as valid national security requirements will permit. Industry must remain constantly aware of the dangers of information controls which could be applied to discourage competition or to permit any kind of favoritism.

There may always be a requirement for some type of program to permit access to information being prepared for or in process of declassification. It need not be extensive.

*Mr. Trapnell served AEC as a special assistant to the General Manager and in other positions, beginning with Manhattan Project in 1946.

In a recent survey, only four companies of 26 contacted said an AEC access permit had no immediate benefit.

ence Board, New York. More than 600 executives have taken the course to date. (Cost will run about \$700.)

- (5) Consider applying for an AEC access permit. More than 1100 permits have been granted to U.S. companies and self-employed individuals to secure restricted data on the civilian aspects of atomic energy. About half the permits are usually issued within a few weeks. This time is needed for limited s e c u r i t y clearances (confidential data) for those in the company who will have access to the information. Complete clearance (for secret data) takes about 3 months. There is no charge for the permit and for the first 25 limited personnel clearances. For more details, write Technical Information Service, Atomic Energy Commission, Washington 25, D. C.
- (6) Bear in mind that there is an enormous mass of unclassified material information. From the source listed in (5) above you can secure a booklet, "What's Available in the Unclassified Atomic Energy Literature."
- (7) Call in a consultant specializing in this field.

Of all the approaches, beyond the preliminary stages listed above, the access permit has aroused the most interest.

What Survey Shows—To find out why companies in the metalworking field, but not in atomic energy, have applied for access permits. THE IRON AGE surveyed a cross section, talked to engineers and executives in these companies. Besides finding out "why," the queries and interviews covered benefits they have received or expect to receive from their access permits—and what type of products they want to sell in the atomic energy field.

J. F. Oehlhoffen, vice-president, Kaydon Engineering Corp., says, "We knew that special ball and roller bearings would be needed on AEC equipment. With the permit we have talked to AEC people we otherwise wouldn't have seen. We will learn more about their equipment activities; are now making a 107-in. diam reactor bearing."

To C. W. Springer, director of research and development, Graver Tank & Mfg. Co., the advantage of the permit is quicker clearance when visiting AEC installations. Graver has been in the field for years, makes reactor vessels, storage tanks, etc. "We have obtained valuable information in the field of metallurgy from the papers available to us under the permit," he added.

Chicago Bridge & Iron Co. feels it speeds up security clearance for inquiry projects. "And we have used it," says sales vice-president F. L. Goldsby, "to attend meetings to which we would not otherwise have access."

R. E. Risley, director of engineering, Dresser Mfg. Div., Dresser Industries, Inc., has a nuclear engineer on his staff. This plant's interest is in pipe joints. Through the permit, he has talked to people at Oak Ridge he otherwise might have had difficulty seeing.

Clevite Corp., is interested in fuel elements, control rods and bearings. A. D. Schwape, materials division manager, rates permit benefits as access to classified information and ability to see AEC people.

Kaiser Metal Products, Inc., was prompted to apply for a permit by some of the reactor manufacturers who wanted close tolerance complicated parts in the high temperature field. "We have already negotiated contracts for these components," said D. E. Egan, manager, defense sales.

J. P. Kovacs, vice-president, Purolator Products, Inc., feels the permit is worthwhile, "We have

WHAT SURVEYED PERMIT-HOLDERS MAKE:

Bearings, ball and roller
Blowers
Castings
Ceramics
Combustion equipment
Filters
Gas cleaning equipment
Heat exchangers
Machine Tools
Melting furnaces
Pipe joints
Structural steel erection
Tanks
Vacuum furnaces & pumps
Water conditioners

definite ideas on products which will be beneficial to the AEC." Some lie in the area of filters and separators, he reports.

Riley Stoker Corp. has a nuclear engineer to head up its work on reactor shells and heat exchangers. "Our interest," says L. E. Griffith, president, "is in production development and components for nuclear energy power plants."

Permit Aids Most—Out of 26 companies contacted, only four said that the permit had been of no benefit; and three of these said that they had received it too recently to expect any results.

None of these companies has a nuclear physicist to head up this work; four have nuclear engineers, six use metallurgists. In 11 companies an engineer heads it up; the balance use management people.

On February 11, AEC began a huge new declassification program which may take six months to finish. It is just possible that this may declassify so much reactor data as to reduce the need for access permits. Right now, AEC won't hazard a guess one way or the other.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



POURING THE METAL: A furnace tender pours the molten aluminum casting alloy into a sand mold.



REMOVES RISERS: Band saw operator removes risers from easting of the high-strength material.

New Aluminum Alloy Features High Strength, Good Castability

Manufacturers sometimes prefer castings to forged, stamped or machined parts. They don't require large presses, costly dies or extensive machining.

Now, a new aluminum alloy adds other benefits. It has high strength and good castability.

■ A new high-strength aluminum casting alloy features high strength and good castability. Using the material, an aircraft firm is now casting some of its jet plane parts instead of forging them.

The alloy's developers, metallurgists at North American Aviation, Inc., Los Angeles, believe that it is possible to cast many items that are presently being machined.

Part Has High Strength—Designated as 42B, the alloy possesses impressive ultimate strengths. Moreover, it shows a good balance of yield and elongation. A part cast

in a sand mold has a minimum tensile strength of 42,000 psi; one cast in a permanent mold registers 45,000 psi strength.

The aviation company is substituting some castings for high-strength forgings; they will use these on the firm's F-100 jet aircraft built for the U. S. Air Force. Since production of these intricately-shaped forgings requires 1 a r g e presses, expensive dies, and costly machining operations, the switch to castings offers a chance for considerable time savings. It could also cut costs, labor and material needed.

Alloy Casts Easily—Castability of the material is an important factor, too. Since it casts in sand or permanent molds with equal success using ordinary methods, it is a candidate for virtually every foundry.

Foundrymen find these properties very desirable. With such an alloy,

the job of producing intricate, completely-formed parts in a single operation is simplified.

Its best selling point, of course, is its cost cutting. Savings on one part alone total \$200 apiece at North American's plant. A sizeable pylon used for carrying external, stores on jet planes now gets made in a third of the time it would take to make the forging previously used.

Prior to development of this alloy, castings could not be used for this application. They weren't strong enough.

The high-strength aluminum alloy is proving itself highly acceptable at North American Aviation. It is such an improvement over existing alloys, believes lab director D. F. Hayes, that its use may result in the replacement of many forgings with castings in aircraft and other instances, too. Its co-inventors, R. A. Zuech and R. G. Cron, are also optimistic about the new material.



COMPARE CLOGGING: Here are files (processed, top, unprocessed, bottom) after 500 strokes on aluminum.

Chrome Coated Bench Tools Last

Files, bits and bandsaw blades aren't capital equipment in terms of production expense.

But they are cost irritants in any shop's operations. Anything which extends small tool life bears serious consideration.

A new chrome-coating process now greatly extends their shop life.

■ Small cutting tools—files, bits, bandsaw blades and the like—aren't in the same league with, say, machine tools. But these expendible items do add up substantially in the overall cost picture. Department of Commerce reports, for instance, show that some \$40-million of files alone were sold last year.

A new process for chrome-plating such tools is greatly increasing their shop life. In some cases life is doubled and tripled.

Tiarco Corp., of Clark, N. J., developed the method. Called Kromolloy, the process essentially permits hardfacing tools with a uniform chromium coating only 0.000050 in, thick. This is sufficient so that the company can guarantee file purchasers, for instance, that they'll get a minimum 100 pct

increase in wear over what they've been getting with unprocessed files.

Not Resharpened—Files are a particularly interesting application. First, because practically every shop uses them—there are more than 3500 kinds available. Second, because—unlike drills, taps, end mill cutters and other items—these tools can't be resharpened very eosily. They're generally thrown away. And most shops leave it up to the worker to decide when a new file's needed.

Tiarco claims that its Kromolloyed files offer higher hardness (Rc 70-72 as against Rc 60-65 for the unprocessed tool) and improved rust resistance. On this score, they say that, where standard files will rust within minutes in a salt spray machine, the processed tool will rust within a 48 hour period.

Won't Use Them—Since workers will frequently discard a file if it has even a slight trace of rust, this is an important feature.

Files are also non-clogging when processed. The company does qualify this claim with one proviso—files won't clog if the same processed file is used as was being used before. For instance, a job where a 12-in. flat bastard file was used before should take a 12 in, proc-

essed file. The new file won't clog then on the work.

Data from some leading metalworking firms a m p l y confirms longer-life aspects of these claims. Tests were made with both experimental and production setups.

A textile machinery firm distributed the processed files in several departments for a comparison of cutting life with standard files. On snagging operations, 14 in. bastard files were lasting approximately one month. Processed files, at the end of two months without replacement, were estimated to have another month's use remaining in them.

Supporting Data—The other shops reported similar experiences—12 to 13 days' life as against standard files' average 3 to 4 days; 10 to 14 days' life as against 5 or 6 days for the standard. This firm reports its "general consensus," based on two months shop experience, that files are two to three times better than the standard files.

A footnote comment by this same company appears to bear out another advantage cited for the processed tool.

"All the operators prefer the new tool," the textile machinery firm notes. This would seem to verify Tiarco's claim that Kromolloyed

Longer

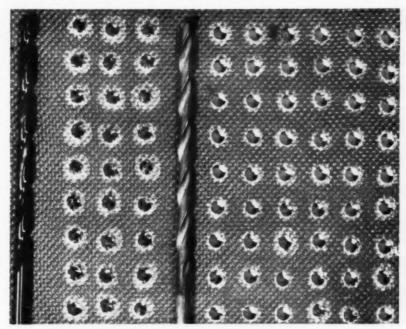
files require less physical effort and —being harder—cut easier and faster than standard files.

Hardness Limit—The Kromolloyed files won't perform on metals beyond their own hardness. They aren't recommended for materials exceeding Rc 68.

A firm making process machinery and flexible couplings likes the processed files both on the score of performance and long life. They're not documenting their tests with the files. But they have made them standard throughout the plant.

How about kinds of material cut? One firm found life of files increased in cutting stainless steel and aluminum. On rough files, they report particularly good results in longer life, since no filings stay caught and a rough cut was always obtained.

Dollar savings of course vary all over the map. But one firm which has to burr-file ring gears after teeth are generated in them found the Kromolloyed files would produce yearly savings on the single application of some \$112. This is based on 40 hours normal life for a regular 14-in. half-round file, during which 1500 gears are filed. The processed file served for 4775 gears before wearing out.



CLEANER HOLES: Quality of cuts in terms of being clean is the important thing in this comparison test of processed, unprocessed drills on fiberglas. Number of holes is of interest, but was not done scientifically in terms of checking maximum cuts for each.

Other Findings—How have Kromolloyed tools stood up on other machining operations—dril!ing, sawing, reaming?

The manufacturing engineering department of one large company tested the process for piloted drills, used in drilling condensor support tube plate holes, Regular unprocessed drills made an average 30 holes; Kromolloy tools made approximately 500 %-in. holes drilling through stacks of four %-in. thick plates. After regrinding, another 200 holes were obtained before further grinding.

Other tests of Kromolloyed tooling, planned or already underway by the same firm, will check its usefulness on filing, tapping and drilling of cast iron and brass parts and (later) on drilling of Muntz metal tube heads and the grinding of impeller waterways, using chrome-processed burrs in place of carbide burrs.

Cuts Fiberglas—Processed drills did well in other-company testing for cast beryllium copper and laminated fiberless cutting. The cast beryllium copper application called for reaming a 7/16-in. deep hole. Standard reamers tended to bind and pick up on the material after 3 to 4 holes. The processed tool reamed 125 holes without binding or material pickup and then showed no appreciable wear.

Laminated fiberglas is particularly abrasive and rough on tools. A military aircraft firm boosted the number of holes drilled on laminated fiberglas production parts from 40 to 340 by switching over to the processed drills. And it eliminated the need for a pilot hole. The same firm had bandsaw blades processed; found it could then cut and trim 32 fiberglas splitters where before, each splitter fabricated required a separate blade.

Processing band file blades jumped life from 6-8 hours formerly to 40 or more hours in another plant. Apart from other advantages, this eliminated the fuss and bother of removing blades, sending them for resharpening, then reinstalling. The company's considering eliminating recutting altogether.

Cutting Tools: Great Promise For New Materials

By R. T. Hook-Chief Metallurgist, The Warner & Swasey Co., Cleveland

Cutting tools of carbon and high speed steel, Stellite and cemented carbides have been adequate for many years.

But today's pressures for faster machining are sprouting new materials every few months.

Some appear to have very bright futures. Here's the up-todate story on the various types.

• Where materials for metal cutting tools are concerned, we are advancing faster than at any time in the history of the metal cutting industry. In scanning past and current progress it seems likely that the 1954 to 1958 period will be marked by tremendous developments in cutting tools.

The objective: higher machining speeds and resultant lower costs.

Demand for reduced cost in machining and overall production has never been greater, particularly now when industry seems faced with a continual three percent boost in wages each year.

Research Pays Off—To meet this demand, research expenditures are at an all-time high. And these studies are paying off. They're bringing advancements in the science of metallurgy and metal removal that open the door for a variety of possible new cutting tool materials. Several very promising ones are already in development stage.

One of these new materials is titanium carbide. At least three

companies are marketing it, and another firm is known to have about four different grades under development. At least one of these grades will doubtless appear on the market within the next year or so.

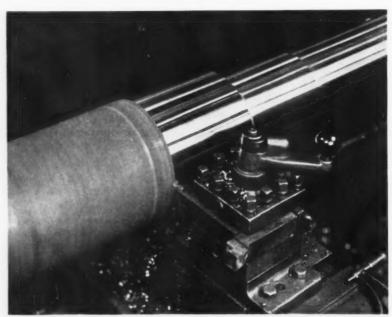
Resists Welding—One reason behind the development of titanium carbide is that its welding-on temperature is above that of the present steel cutting grades of tungsten carbide, as shown in the accompanying table. Second, titanium carbide, bonded by nickel, molybdenum or some other material, is non-strategic from a supply standpoint.

Third, the material at the presenttime will cut 2½ to 3 times faster than tungsten carbide. This brings a parallel benefit since it is known that, feed for feed, faster cutting yields finer workpiece finishes.

As an interesting side note, titanium carbide also has greater impact strength than present-day ceramic tools. In this regard it shows great promise. Fig. 1 compares titanium carbide tool life with that of other materials in turning AISI 1045 steel.

Has Faults, Too—At the moment, there are three basic drawbacks to more widespread use of titanium carbide:

First of these is a matter of quality control—it's extremely difficult



FAST WORK: Tests of new cutting tool materials usually involve turning stepped diameters on metal shafts at various combinations of speeds and feeds. Here, ceramic tool is tested.

to make a product of consistent quality.

Secondly, at the higher cutting speeds there is a greater tendency for the material to chip because of the higher hardness.

Finally, while titanium carbide can be brazed, it is done only with difficulty.

Two other potentially valuable cutting tool materials are also in the development stage: titanium boride and molybdenum boride.

A leading development firm, attempting to produce a new jet engine bucket blade, tested some titanium boride in the form of a cutting tool. With it, they machined a high speed steel milling cutter with hardness of Rockwell C62 at about 100 sfpm.

Good Tool Life—Fig. 2 shows that titanium boride wears relatively fast in the first few minutes of cutting, but wear then tapers off to a much lower value than the cemented carbide material shown in the comparative curve.

To add another fact, a major research program is underway to develop a boride cutting tool (presumably of titanium) that will provide the welding-on temperature shown in the aforementioned table.

The Government is sponsoring the development of molybdenum borides for milling titanium. Titanium tends to weld onto tungsten carbide milling cutters with the result that tool tips often break out on the second pass. Molybdenum does not have this affinity for titanium, nor is it as strategic a material as tungsten.

Next Case—Now for a look at the new and perhaps better known ceramics. What are they? What can they do? What impact have they had on the metal cutting industry thus far?

Before we get too far into the various applications of ceramics, let's define the word as we are now using it.

Webster defines ceramics as "oxides of metal which have been baked." In this sense the ceramics proposed as cutting tools are mainly

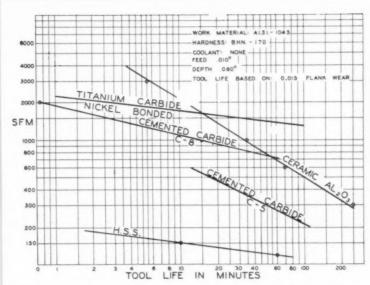


FIG. 1: Matched against other cutting tool materials, titanium carbide shows excellent tool life.

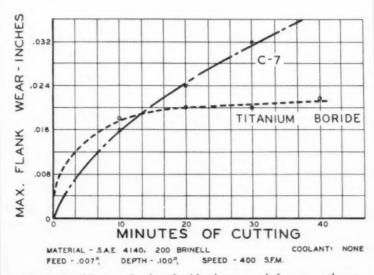


FIG. 2: On this test, titanium boride shows much less wear than a C-7 grade of cemented carbide.

aluminum oxides which have been sintered. Certain additives may be used as bonding materials, or to increase the physical strength of the aluminum oxide. Suitable cutting tip shapes are made either by cold pressing or hot pressing.

Behind It All—Current interest stems largely from two recent happenings: Active development of ceramics in the USSR, starting around 1948, and development at our own Watertown Arsenal. This apparently began about 1954. Research began on Sintox, the British ceramic, in 1935. Earlier investigations were general in nature, and were not directed at metal-cutting.

They Look Good—From a practical standpoint, ceramic tools for turning metal can be credited with such advantages as: (1) ability to

Average cutting speeds used with ceramics range from 400-1400 sfpm. Speeds can go to 3000 sfpm on some materials.

reduce overall production costs due to faster machining speeds, and (2) ability to improve surface finishes in workpieces compared to the finishes produced by carbide tools at equivalent speeds.

In fact, ceramics have already proven to be the answer to the problem of how to machine many of the present-day alloys that are so difficult to cut.

Perhaps the best feature of ceramic tools is that the basic aluminum oxide is abundantly available in such forms as emery, corundum, ruby and sapphire.

Price May Drop—Because of this abundance, plus the prospects of widespread usage, some tool engineers expect eventual reductions in the price of ceramic cutting tips. The present price, about 50 pct higher than that of carbide tips, is based largely on the need for diamond grinding in preparation.

The most dramatic cost reductions, however, are likely to result from still more research into applicability and statistical analysis of results under controlled shop conditions.

Ceramic tips seemingly lack brazing quality. Therefore in actual shop use, clamped-on tool holders appear to be a necessity. These holders come in two basic types, namely the throw-away-insert type and the long slug type.

Holders that use throw-away tips are available in both positive and negative rake forms, while the long slug type comes with a negative rake only. A precision ground utility insert about ¼ in. thick is used in the throw-away model; a slug 1½ in. long fits in the long slug type of holder.

What's Best — Double negative 5°-5° rectangular ceramic tips currently appear best as they provide four cutting edges. Carbide shims are a must for proper support of the tips, and there is a direct relationship between the thickness of the ceramic and the contact area of the shim.

With thin ceramic inserts this is so critical that some users lap the ceramic tip to the shim for complete contact. Experimentally, however, cutting tips have been cemented to steel shanks with very good success.

Carbide chip breakers held mechanically and supported still further by brazing also appear to be best for ceramic cutting tools. Wide Speed Range — Average cutting speeds now being used with ceramics range from 400 sfpm to 1400 sfpm. On some materials speeds can go as high as 3000 sfpm, but ceramic tool life is affected by cutting speeds just as is the life of carbide tools.

Depth of cut with ceramic tips can range from a light finishing cut of 0.010 in. to as much as 0.375 in. Feeds in normal practice range from a light finishing approach to as much as 0.027 ipr. The use of coolants with ceramic tools presents no problems. In fact, the tools often perform better with coolants than carbides do.

Grinding Tips — Techniques for preparing ceramic tools are essentially the same as for carbides. However, they grind much easier than carbides and tool grinding personnel should be so cautioned. Ceramics are notch sensitive, and so good grinding practice is also essential. If fractures are not visible under a 20-diam toolmaker's microscope, no failure is likely to occur because of grinding techniques.

Several improvements are still needed in ceramics. One, especially, applies to the consistency of the materials. Metal removal rates with apparently similar tools have been known to vary from 72 cu. in. to as high as 3700 cu. in. at 1300 sfpm. with feed rates also held constant.

Must Take Shock — Then, too, ceramic tips still need sufficient improvement in impact qualities so that the lead angle may be reduced. Reports from Czechoslovakia indicate that they have gained greater impact strength in these tools at the expense of a slight drop in hardness, and that they are now able to take interrupted cuts.

An early starter in ceramic cutting, the Warner & Swasey Co. is doing extensive research to judge how these materials will affect future machine tool designs. The firm also has contracts with Ohio State University and Massachusetts Institute of Technology to help explore the full potential of ceramic tools. The belief is that these programs will bring significant developments.

Welding-On Temperatures Between Steel and Hard Particles

Particle	Welding-On Temperature	Temperature to Soften	Vickers Hardness No.
Carbon Tool Steel		375° F	
H.S.S. 18-4-1		1000° F	
Chromium Boride	250° F		
Titanium Boride	2250° F	0.00	4200
Zirconium Boride	2250° F		3600
Tungsten Carbide	2400° F		2400
Titanium Carbide	2500° F		3000
Aluminum Boride	2600° F		3800
Alumina	over 2800° F		3000

Furnace Braze Honeycomb Panels For Better Bonding

Sandwich structures are stepping from the aircraft field into more general use. Construction people are particularly interested.

If you're after this business, you must find ways to cut production costs to reasonable levels.

Furnace brazing can be oneway. Parts join automatically as they pass through the heat.

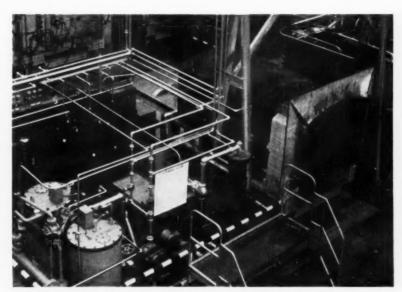
■ Furnace brazing effectively answers the question, "How should sandwich structures be bonded?" For Convair Div., General Dynamics Corp., Ft. Worth, furnace brazing is an important step in building honeycomb panels of stainless steel.

Honeycomb sections, frames, end closures and skins—all of stainless steel—first are well cleaned. Operators handle all cleaned parts with cotton gloves to avoid contamination before brazing.

After the honeycomb sections are set in their frames, they are faced with brazing foil of silver-manganese alloy. Atop the foil go the stainless steel skins, one on each side.

The unbrazed workpieces are loaded in a massive alloy retort mounted on a furnace car. Retorts can handle a 1000-lb load, measuring 54 x 90 x 39 in. high.

How It Works—The brazing setup, supplied by Holcroft & Co., Detroit, consists of four stations, (1) load and unload, (2) purge, (3) brazing furnace, and (4) cooling chamber. The transfer equipment, rolling on twin rails, moves and positions two furnace cars at once to the various stations.



RETORT CONTAINS WORK: End closure plug for brazing furnace (upper left) shows at end of retort (right).

After loading, the furnace car is moved on the transfer dolly to the purge station. There the retort is purged with protective atmosphere gas. The dolly then shifts the car into the heating chamber.

Flexible hoses are attached to the insulated, water-cooled plug on the forward end of the retort. This plug forms the end closure of the furnace. The hoses permit car movement without interrupting the flow of purge gas. Positive gas pressure in the retort prevents entrance of air.

Close Control—Standard BAgMn brazing filler metal calls for joining heats of 1780° to 2100°F. Maximum furnace operating heat here is 2150°F. Tests run at 1815°F show a temperature variation of 15° throughout a 1000-lb load. At 1400°F, temperature variation is 30°F.

The furnace cycle adjusts for any desired program, including a specified rate of heating and cooling.

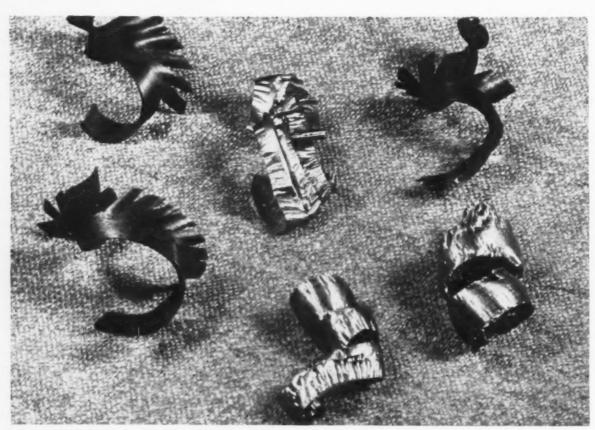
Top burners tilt upward slightly so flames do not play directly on the alloy retort. Bottom burners fire through tunnels within the furnace car itself. Silicon carbide tile laid atop these tunnels protects the retort against direct flame.

Heats Quickly — The tile's high thermal conductivity allows fast heat penetration through to the retort resting on it.

Each burner has a spark igniter. A flame rod controls both pilot and burners. If flame fails, the safety gas valve closes.

After brazing, the load is transferred into the cooling chamber. There a volume blower air-cools the retort to room temperature.

The furnace car then is transferred to the unloading station. Panels are removed to a refrigeration box to assure complete transformation. X-ray inspection follows to check soundness of the brazed joints.



SAME HARDNESS: But leaded grade 4140 steel chips were made 60 pct faster, at 20 pct heavier feeds.

Why Leaded Forgings Favor Machinists

Confirmation keeps coming in —leaded steels machine beautifully.

But — how beautifully? And which leaded steels work best under which conditions? Industry continues piling up quantitative data.

Latest test runs checked performance on forgings and rings.

Machining tests on forgings and rings manufactured from a newprocess leaded steel are turning up impressive reductions in tool wear and gains in machinability. Faster machining and—in some cases—improved fatigue properties result.

Alco Products, Inc., makes the new steel product. Trademark registered as Hi-Qua-Led, it's produced at Latrobe, Pa., by an exclusive lead-addition method. The company's keeping quiet about this. But it says many companies which have conducted extensive tests are now using the steel in regular production.

How well has the material performed in forgings? Let's look to tests conducted over the past sixmonth's period for a partial answer.

First example is the machining of two rings of 1075 grade steel and two of 10L75 grade. The "L" indicates leaded steel. Saves 4 to 8 Hours—Each pair of rings was furnished to customer company "A" in the annealed condition, and heat-treated before machining to Scleroscopic hardness of 45, or a Brinell (estimated) of 321-355. Prior to heat treatment, a keyway was rough cut in the bore, making all cuts in the internal diameter interrupted. This reduced the effective machinability of that surface.

A Gisholt L140 machine with independent compound slides and turret was used. First leaded-steel ring was machined in less than four hours, not including time required to finish the end held in the chuck. This time compared to a regular

MILL T	EST	DATA	ON	REPRESENTATIVE	CARBON	GRADES	
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Grade	Bhn, Average	U.T.S., psi	Yield Strength, psi	Elonga- tion, pct	Reduction of Area, pct	Charpy, Average	Section Size
10L45	210	109.080	68,250	20.6	39.8	41.4*	111/16 x 121/4 in
10L45	208	106.060	62.870	20 2	41.8	15.1*	31/4 x 201/4 in
1045	218	109.250	63.800	17.8	35.9	12.25*	31/4 x 201/4 in
10L45	235	113.750	71,980	22.8	44.5	21.75	28/16 x 101/4 in
10L45	242	122.370	85,000	22.0	45.7	20.9	43/8 x 111/4 in
10L50	232	117,250	73,250	22.2	43.5		31/16 x 121/4 in
10L50	234	117,000	72,250	20.8	43.1		31/16 x 121/4 in
10L60	260	137, 290	79.480	17.3	33.4		8 ³ / ₁₆ x 13 ³ / ₄ in
10L70	311	157,170	103.750	13.8	26.2		4 x 83/s in
10L70	279	144.850	86.870	15.7	37.0	10 0*	23/16 x 111/4 in

All Sections Oil Quenched & Tempered.

* Keyhole Notched Specimen (Others V-Notch).

shop requirement of 8 to 12 hours on a similar ring of regular 1075 steel.

Thus, time saving with the leaded steel amounted to between 31 and 58 pct. Tool life and surface finish improved simultaneously.

Next, in the same test, the ring of regular 1075 was chucked and the company decided to try the same speeds and feeds as were used on the 10L75 ring.

Too Rough—After machining the outer face a multiple cut was begun. Both tools failed in about ½-in. of travel. New tools were inserted and the cuts resumed—but tools showed evidence of melting after about 1 in. of travel.

Another company checked the material on gear-cutting.

In this test, gear blanks of 4140 and 41L40 steel were shaped on a Fellows 36 type shaper. The follow-

ing speeds and feeds had been customary with previous 4140 blanks:

Rough cut of 0.530 in. at 50-60 sfpm and a feed of 0.0145 in. Finish cut 0.033-in. deep at same speed and feed.

How Long? — Total time for the operations: An average of $3\frac{1}{2}$ hours plus downtime for tool breakage.

The 41L40 gear was machined at 0.538-in. depth of rough cut at 82 sfpm and a speed of 0.0176 in. A finish cut of 0.025 in. was made at 108 strokes or 100 sfpm, with a feed of 0.034. Total time for these operations: One hour, 14 minutes.

Dimensions and surface finish on the first two Hi-Qua-Led gears was judged by shopmen to be better than that normally attained. Other machining comparisons and mill test data on carbon and leaded-steel grades are shown on the accompanying charts.

Evenly Dispersed—Metallurgists report lead distribution in the material is good. The company has developed special test methods to check for segregation.

Alco uses the techniques to quality-control-check that submicroscopic distribution of the lead is uniform in both forgings and ingots.

MACHIING COMPARISON—GEAR CUTTING

Steel	Brinell Hardness	Cutting Speed	Feed	Depth Of Cut	Improved Time	Increased Tool Life	Decreased Tool Wear	Tool Wear
4137	290 330	35 Strokes	0 028					1/4 in.
41L37	290 330	35 Strokes	0.028			1600 pct	94 pct	1/64 in.
4140	285-302	37.5 Strokes	0.0174					0.0437
41L40	285-302	46.5 Strokes	0.0237		41.2 pct	437 pct	77 pct	0.010
4150	285	89 Strokes	0 0237	0 620 Rough				
	255	89 Strokes	0 0237	0 030 Finish				0 028
41L50	255	111 Strokes	0 0295	*0.620 Rough	21.1 pct	200 pct	50 pct	0.014
41L50	255	111 Strokes	0.0368	*Rough & Finish	47.4 pct	187 pct	46.5 pct	0.015
1070	240-260	32 rpm	0 048	0.690				0 020
10L70	240 280	40 rpm	0 076	0.690	50 pct			0.020

* Free of heavy burrs that had been evident on regular material.

Electricity Plays Many Roles in Welding

By A. C. Ward-Welding Dept., General Electric Co., York, Pa.

A complex process starts when you strike a weld arc. Knowing what takes place will help improve your arc welds.

This is so because the nature of the weld arc affects your welding technique, and hence joint quality.

The electrical qualities discussed here are the forces that cause change in the weld arc.

Consistently good welds depend fundamentally on a good arc, and your technique in handling it. The character of the weld arc changes with the kind and amount of electricity powering it. Understanding what happens inside the arc stream can have one result—a better weld.

Any explanation of the arc in consumable electrode arc welding gets down to the electrical basics. On these basics depend your choice of equipment, electrode, current used, and arc welding technique. Other factors are affected, too, but electricity is behind them all.

The whole point of arc welding current is to heat the joint and the electrode. Start electricity flowing in a circuit, and you get one or more of the following effects: (1) heat, (2) a magnetic field, (3) mechanical changes, and (4) chemical changes.

You want to know how to get the best weld heating, while minimizing other effects. For this, you must understand what happens when electricity flows in a weld arc.

Like Water—The flow of electricity corresponds essentially to a flow of electrons. It's convenient to think of the electrons flowing through the weld cable, into one end of the electrode, and out at the

arc. This concept fits the end results, at least when using direct current. Consider an electron as a tiny bit of energy capable of releasing heat.

As electrons flow through a conductor, they meet resistance. All conductors resist the flow of electricity to a greater or lesser extent. Think of this resistance as a kind of friction.

The "friction" creates heat as the electrons pass through the conductor. It will do no harm to picture the electrons rubbing against the conductor, producing heat.

You can increase the heat thus created in several ways.

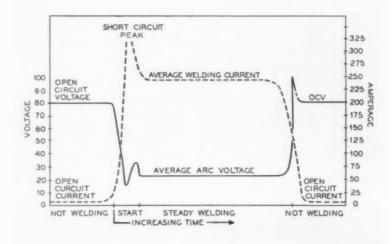
First, you can squeeze more electrons through the conductor in the same time interval. This happens when you increase either the electron flow (amperage), or boost its pressure (voltage).

Second, you can use a conductor that more strongly resists electron flow. This is resistance heating. The first you can call are heating.

Enter Time—All this is expressed in the formula. H=0.239 I²Rt. You can see what happens on raising the amperage (I): You get more heat. Increase the resistance (R), and heat goes up also. And of course, the longer the electrons flow through the arc (time=t), the more the heat.

In shop practice, you use both these approaches to produce heat. Resistance heating devices create heat by running electric current through wire conductors that strongly resist passage of electrons. Nichrome wire is such a high resistance conductor.

In arc welding, you use a different approach. The idea of getting



WHEN YOU'RE WELDING: Both amperage and voltage change when you start welding, again when you break the arc. These changes momentarily affect heat output of the arc. And heat output is a factor determining the welding technique used.

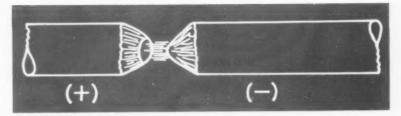
high heat through resistance doesn't apply here. Resistance is just too low.

You can check this on any typical weld circuit. In the example nearby, 240 amp, 24 v dc results in 0.1 ohm resistance. Compare this low value with the resistance of a white-hot, 40-w lamp bulb: about 300 ohms:

Closely Packed—Still, there is a lot of heat in a weld arc. It comes about because of the enormous flow of electrons through the weld circuit.

According to several theories, these electrons tend to pile up at the electrode tip, if it is negative. Some view this crowding action by the electrons as largely responsible for production of heat across the arc. The heat melts tiny particles and droplets of weld metal on the electrode tip.

To find out how much heat is generated, you could use the formula: H=0.239 I²Rt. Heat (H)



ELECTRODE BURNOFF RATE: These two carbon electrodes show what happens in the arc: positive electrode emits 85 pct of heat.

is measured in calories. One calorie of heat will heat one gram of water one degree Centrigrade. The same calorie of heat will warm the same amount of iron about 9°C. Table I shows what happens with other metals.

Figure Melting—It's not hard to find out how much steel a certain number of calories should melt. The results you get will not be exact. But they will be close enough for almost all shop work.

Steel melts between 2300 and 2500°F, or somewhere near

1350°C. You want to heat the steel from room temperature to 1350°C.

Consider a typical case. You weld at 240 amp, 24 v for 55 seconds. Room temperature is 68°F, or 20°C.

You know 1 cal will warm 1 g of steel 9°C. So about 150 cal will heat 1 g of steel from room temperature to its melting point. In the same example, you have 75,715 cal available. (You got this by multiplying 0.239 x 240 amp x 240 amp x 0.1 ohm x 55 seconds.)

Here's the theory	It's applied this way**
WHAT'S THE ARC RESISTANCE? Resistance (ohms) = $\frac{\text{voltage (E)}}{\text{amperage (I)}}$	$R = \frac{240}{24} = 0.1 \text{ ohm}$
HOW MUCH POWER DO YOU DRAW? Electric power (watts) = amperage (I) × voltage (E)	W = 240 × 24 = 5760 w (about 7.7 hp
HOW MUCH HEAT DO YOU GET? H = 0.2391°Rt Heat (calories) = 0.239 × amperage × amperage × resistance (ohms) × time (seconds)	H = 0.239 × 240 × 240 × 0.1 × 55 = 75,715 calories
HOW MUCH METAL WILL THIS MELT? Metal weight (grams) =	Weight = $\frac{75,715}{(1350 - 20) \times 0.11}$ = $\frac{75,715}{1330 \times 0.11}$ = 517.5 g = about 17 oz, or 1 lb 1 oz

^{**} In this example, assume you weld mild steel 55 seconds using a 3/16 in. diam E-6012 electrode with straight polarity direct current at 240 amp, 24 v. Temperature is 68°F (20°C).

Here's why you make the electrode positive when welding sheet with carbon arcs...There's less risk of burn-through

One Pound—So by simple division, 75,715 calories will melt near 517 g in 55 seconds. This is about 1 lb 1 oz of steel. The heat is divided between the workpiece and the electrode, after subtracting heat losses to the air. A 3/16 in. diam electrode weighs about 2 oz. Welding with it, there's plenty of heat left over to melt a lot of steel.

The type electricity used also affects the weld. You work with three kinds: alternating current, straight polarity direct current, and reverse polarity direct current. Fig. 1 shows the graphed output of a typical direct current generator. The graph is similar for both straight and reverse polarity direct current.

Now connect the direct current generator into a welding circuit with two carbon electrodes. A curious are condition results. The positive electrode burns away much faster than the negative electrode (Fig. 2). In addition, the positive electrode emits about 85 pct of the light coming off the entire arc.

Uneven Heat—Obviously, are energy is not equally distributed. This at least in a direct current are with carbon electrodes.

Here's the reason for always mak-

ing the electrode positive when welding sheet metal with carbon arcs. Concentrating heat on the electrode (instead of the workpiece) reduces the risk of burn-through.

It would be convenient if you could apply the same concept to coated electrodes. But you can't. The coating chemicals sometimes enter into the arc action and disturb the heat distribution.

Shop experience helps here. It shows that the E-6010, E-6012 and E-6020 electrodes act as do carbon electrodes. With these three, the hottest heat and the fastest burnoff occurs on the positive side. (E-6011, E-6013, E-6024 and E-7016 electrodes show smaller differences in burnoff rates.)

Now you have some reason for one electrode behaving differently from another.

Same Steel—Consider the E-6010 and E-6012 electrodes, for example. Both use the same core wire. Both deposit nearly the same weld metal composition.

You use direct current reverse polarity with the E-6010. This means the electrode is positive. So weld metal from the electrode contains the greater portion of the arc energy. As a result, the weld metal tends to be hot and fluid. On cooling, it forms flat fillets and flat cover beads.

The E-6012, on the other hand, is designed for use with straight polarity direct current. This means the workpiece is positive. Weld metal coming off the electrode contains the smaller portion of the arc energy. It tends to be cold and viscous. The cooling weld metal forms convex fillets and elevated cover beads.

Alternating current is really a half cycle of reverse polarity direct current, followed by a half cycle of straight polarity direct current. So it's not surprising that alternating current weld deposits show a character midway between beads laid down by straight and reverse polarity direct current. Arc heat is almost equally divided between the electrode and the workpiece being welded.

When You Weld—Now, how can you apply all this information to get better welds?

Take electrode selection first. You can predict generally how the more popular electrodes will behave from the type of electricity used with them. That means you can do a better job of picking the right electrode for the job.

Knowing how electricity affects welding will also help when you run into trouble. Assume you use the electrode specified for the kind of work being done. But it still isn't giving consistently sound welds. Some quirk in part design can account for this.

To solve such a problem, go back to the weld heat formula. Figure whether or not it is reasonable to expect a sound weld. Do this by estimating how much steel the arc heat available will melt. (Remember to correct for electrode weight and heat losses to the air. Your electrode maker's representative can help here.)

Applied properly, just these two points may help improve your welding. They can cut the time now spent in adjusting arc current and welding technique.

TABLE I
What Arc Heat Does To Metals

Metal	Specific heat	Temperature increase, °C°
Aluminum	0.22	4.6
Iron	0.11	9
Steel	0.11	9
Copper	0.09	11
Silver	0.05	20
Lead	0 03	33

* Ignoring other factors, 1 cal heats 1 g of metal the given amount.

Watch Arc Length

If too long,
heat loss can
change heat distribution in arc.
This may affect

the way the electrode melts, and the way the bead deposits.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 149.

Press Conveyors

Belt conveyors for moving stampings or scrap from press to tote bin are described in two singlepage bulletins. (The Rapids-Standard Co., Inc.).

For free copy circle No. 1 on postcard, p. 149

Blast Cleaning

Automated techniques for high speed blast cleaning are presented in a 20-page bulletin. It carries specifications and dimensions for barrels from 1½ to 27 cu ft size. (Pangborn Corp.).

For free copy circle No. 2 on postcard, p. 149

Silicone Products

More than 115 different applications for silicones are listed in an 8-page catalog. (Silicone Products Dept., General Electric Co.).

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Grinder Tools

Grinder tools are described in an 8-page bulletin. The tools, which are classified as "light heavyweight" machine tools, include a surface grinder—also used as a chip-breaker grinder—floor and bench model tool grinders, workholding accessories, and a metal dust collector. According to the bulletin, the tools offer rugged construction and precision accuracy at low cost.

(Walker-Turner Div., Rockwell Mfg. Co.).

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Overhead Doors

Industrial overhead doors are covered in a 16-page catalog. The book gives specifications and instructions for preparing building openings. (Barber-Colman Co.).

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Non-Shrink Mortar

How to get better results in 12 important construction operations by using non-shrink mortar is discussed in a bulletin. (The Master Builders Co.).

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Bar Steels

Containing 24 pages, a scientific report on "fatigue-proof" bar steel and a new method of manufacture are discussed in a brochure. It tells of an elevated temperature drawing process that results in a tensile Strength of 140,000 psi. (La Salle Steel Co.)

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Cleaning Unit

An injector unit that uses existing steam supplies for steam cleaning, paint stripping, phosphating or sanitizing is shown in a 4-page bulletin. (Turco Products, Inc.). For free copy circle No. 8 on postcard, p. 149

Motion Pictures

The 18th edition of a catalog describes educational and entertaining motion pictures sponsored and distributed by a large steel firm.

This edition includes five new films released in 1956. (United States Steel Corp.).

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Air Conditioning

A series of colorful new product folders illustrate and contain specifications on commercial air conditioning. (Airtemp Div., Chrysler Corp.).

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Conveyor Chains

Table top conveyor chains are featured in a 26-page bulletin. It pictures both steel and nylon chains. Many illustrations show applications. (Chain Belt Co.).

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Ceramics

New name in the high alumina ceramics industry is introduced in unusual booklet showing company's new manufacturing, research and sales facilities. It lists forms available: Oxide cutting tools, grinding media, wear, abrasion and corrosion resistant parts applications; also heat resistant parts, refractories, precision parts. (Diamonite Products Mfg. Co.).

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Conversion Factors

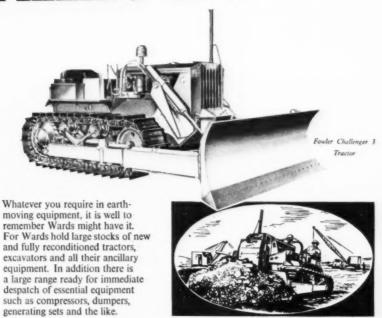
A reference table wall chart includes common conversions such as inches to centimeters or watts to ho as well as many conversions that are difficult to locate in reference manuals. Some such examples are atmospheres to Kgs/sq cm, cm/sec to miles/hr, cu ft to liters, microns to meters, quintal to lbs, etc., etc. (Precision Equipment Co.).

For free copy circle No. 13 on postcard, p. 149

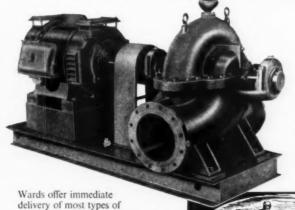
Milling Machines

Ram type milling machines, recently developed, are announced in a dozen page brochure. According to the literature, the new line offers these new advantages: (1) increased work range, (2) more workability and cutability, (3) greater work capacity, (4) more

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useable horsepower, and (5) reduced idle machine and operator time. (Van Norman Machine Co.). For free copy circle No. 14 on postcard, p. 149

Gas Regulators

Industrial gas regulators are illustrated in a 20-page catalog. It includes complete specifications and ordering information for 47 regulators that are available for use with all industrial gases. (Linde Air Products Co.).

For free copy circle No. 15 on postcard, p. 149

Fuels, Lubricants

Cost-free assistance on problems involving fuels and lubricants is beamed at petroleum products users through a 24-page booklet. Goal of this broad engineering program, it states, is to bring the engineering and research facilities of a large oil company close to these problems. (Gulf Oil Corp.).

For free copy circle No. 16 on postcard, p. 149

Switchgear

Metal-clad switchgear maintenance is discussed in an 8-page publication. It outlines a product maintenance program for medium voltage, metal-clad type switchgear and air-magnetic and oil-filled types of power circuit breakers. (General Electric Co.).

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Broaching Machine

Vertical twin ram broaching machines are announced in an 8-page brochure. The new twin ram units come in standard capacities ranging from 5 to 25 tons, stroke lengths from 30 to 100-in. (Detroit Broach & Machine Co.).

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Corrosion Resistance

How to determine the corrosion resistance of aluminum is told in a folder. (Reynolds Metals Co.).

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henever your product is finished one micro-inch more than specified, profit is actually machined away. In the past, this waste was due to the machinist's inability to accurately judge how far he had progressed in his surface finishing operations.

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1	.035	10

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 144.

Machine Tools

Written with machine tool buyers in mind, a firm's catalog lists its current products. The 72-page booklet colorfully illustrates milling and broaching machines, cutter and tool grinders, grinders, grinding wheels, cutting, fluid, etc. (The Cincinnati Milling Machine Co.).

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Stamping Press

Manufacturer's data covers a new hot stamping press, for general purpose use. It stamps up to 1000 pieces per hour with manual feed or a possible 300 pct more with automatic feed. (Acromark Co.).

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Pipe Crimper

Illustrated supplements present a compound leverage pipe crimper. This tool multiplies hand pressure to provide crimping power for reducing the diameter of sheet metal pipe. (Niagara Machine & Tool Works).

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Rivet Headers

Both 3/16 and 5/16-in, solid-die, double-stroke crank headers for cold heading screw and rivet blanks are covered in a brochure. Described are feed, cutoff mechanism, heading unit, knockout drive, lubrication and both WF standard and Phillips type tooling. (Waterbury Farrel Foundry & Machine Co.).

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"Twin Hearth" Furnace

Twin hearths provide "double production" in a new shaker furnace described in a firm's literature. Two parallel sealed hearths mount in this furnace to double the heat treating production of the same work or to heat treat two different types of parts which require the same atmosphere for processing at the same or different time cycles. (American Gas Furnace Co.).

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Track Switcher

How to speed up freight car movement and reduce costs is told in an illustrated bulletin. It concerns the development and use of a freight car mover that travels on track or ground. (Whiting Corp.).

For free copy circle No. 25 on peetcard

Industrial TV

Industrial television equipment appears in an 8-page folder. The booklet illustrates late developments in cameras, monitors, controls, lenses, and other accessories. (Philco Corp.).

For free copy circle No. 28 on postcard

Profiler

A 4-page booklet reviews a lowcost machine for duplicating any three-dimensional contour including swarf or twist cuts. The unit handles aluminum, titanium and steel forgings. (Arrow Engineering Co., Inc.)

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Industrial Belting

Illustrated literature announces new industrial belting, a combination of leather and plastic. It lists operating advantages, economies, and offers a solution for most difficult belting problems, it states. (Extremultus, Inc.).

For free copy circle No. 28 on postcard

Plastic Fibrebrick

Plastic firebrick is introduced in a data sheet. It includes technical reference to pyrometric cone equivalents, workability indexes, dry and firing shrinkage, water content and panel spalling compared to ASTM standards. (J. H. France Refractories Co.).

For free copy circle No. 29 on postcard

Lathe

Lathes, equipped with 32 preselective spindle speeds in geometric progression, are presented in an 8-page foldout brochure. The publication lists specifications. Several photographs illustrate the machine tool's nomenclature. (The Sidney Machine Tool Co.).

For free copy circle No. 30 on pestcard

Thickness Testing

Fast cleaning and degreasing and nondestructive testing from one side of a metal piece are covered in a data sheet. It shows various thickness testing and flaw detection equipment. (Branson Ultrasonic Corp.).

For free copy circle No. 31 on postcard

Type 201 Stainless

Stainless steel type 201 is analyzed in a data sheet. The 4page sheet gives information on this chromium, nickel manganese stainless steel. Such information includes analysis range, resistance to corrosion, resistance to oxidation, physical properties, and mechanical properties. (Allegheny Ludlum Steel Corp.).

For free copy circle No. 83 on postcard

Materials Handling

Four-page bulletins illustrate and describe an 8000-lb capacity fork lift truck. These handling units have pneumatic tires. (Clark Equipment Co.).

For free copy circle No. 33 on postcard

Stainless Steel

A leading producer of stainless and high alloy stainless steel castings has made an extensive research program on 17-4ph precipitation hardening stainless steel. This is a continuing study and results of its first phase appear in a technical notebook. (Electric Steel Foundry Co.).

For free copy circle No. 24 on postcard

Wire Rope

Comparison tables of the breaking strength of wire ropes are included in a leaflet. (Jones & Laughlin Steel Corp.).

For free copy circle No. 35 on postcard

Fasteners

More than 4000 different fasteners, available as stock items, are talked about in a brochure. Standard fastener categories are described in the 6-page folder, along with a company's engineering, quality control and delivery services. (The Chicago Screw Corp.).

For free copy circle No. 36 on postcard

Packaging

Packaging cost reduction, from original package design to final product shipment, is the subject of a 20 page leaflet. (Hinde & Dauch).

For free copy circle No. 37 on postcard

Contact Cements

A folder describes the proper use of contact cements. It contains detailed instructions and sketches for bonding many materials. (Chemical Div., the Borden Co.).

For free copy circle No. 38 on postcard



from research:

better heating for plants and buildings

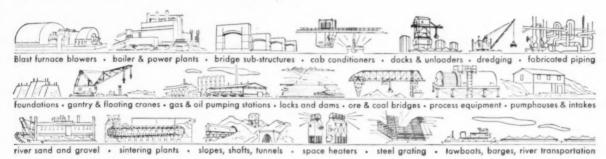
These sales engineers are watching a completely new kind of space heater go into action at Dravo's Research Center in Pittsburgh.

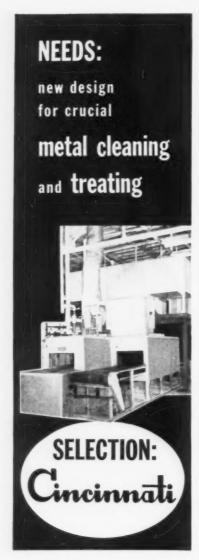
The new Counterflo is a result of years of intensive research and incorporates experience gained from thousands of installations. Many features add to the safety and efficiency of the new heater. Some of these are new dual-fuel PYROJET burner with automatic fuel switch-

over, a new combustion chamber and a more efficient method of controlling combustion air.

Proven and tested, the new heater is a successor to the 15,000 Dravo space heaters already installed in plants, warehouses, arenas, schools, hangars and industrial buildings. Bulletin 564 will bring you complete information. Write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO





You can't afford to take chances on over 2.345 sq. ft. of metal cleaning equipment. That's why Briggs & Stratton Corp., the world's largest manufacturer of 4-cycle, single cylinder, gasoline engines insisted on CINCINNATI. Ingenious use of suspended, platform-mounted and U-shaped units with transfer conveyors fits all 4 machines into just 765 sq. ft., reduces manpower and maintenance.

You can rely on CINCINNATI experts. Write today for details.

Cincinnati

CLEANING and FINISHING MACHINERY COMPANY

2017 Hageman St., Cincinnati 41, Ohio



You Arbitrate It!

BUMPED BY A GENERAL HELPER

From the files of the American Arbitration Association

When John G., a machine operator in the stamping department of a metal furniture company, learned that one of his co-workers was quitting, he was overjoyed. He had nothing against the man, but he had long wanted to change machines. John's own machine was beginning to give him trouble, forcing him to go on time rates while it was being repaired. So he put in a bid for a transfer to a better machine.

But the foreman had other ideas. He upgraded a general helper who had top seniority and put him to work at the vacant machine, whereupon John G. filed a grievance.

"I've got a right to that machine," John said. "I have more seniority in the stamping department than anyone else, and the union contract says that promotion should be by seniority.

"No," said the foreman. "I can't put a man without experience on an old machine. He might not notice it when things get out of adjustment and that would mean spoiled work. Besides, what's the difference? It's

the same job classification and the same time and piece rates on both."

Eventually the case went to arbitration. The union rested its case on the fact that the collective bargaining agreement said that "promotions and upgrading shall be by seniority." The company answered that the assignment of a man to one machine or another within a job classification was part of "management prerogatives." How would YOU rule?

The Arbitrator Ruled:

He said the company was right. The transfer from one machine to another in the same classification and on the same shift was not a "promotion" or "upgrading" within the meaning of the contract. His opinion showed that he was impressed with the reasons the company gave for wanting the less experienced man on a machine that was more trouble-free. The arbitrator also noted that employees had never before been permitted to change machines on seniority.

Caution: The award in this case is not an indication of how other arbitrators might rule in other apparently similar cases. Each case is decided on the basis of the particular history, contract, testimony and other facts involved.

NEW BOOKS

"A New Look at the Nature of the Open-Hearth Process," by B. M. Larsen, U. S. Steel research supervisor, tries to give a unified analysis of the open-hearth process in relation to the factors that control speed and fuel efficiency. It treats rate of heat flow in the bath, rate of carbon oxidation, and net heat requirement from fuel in relation to the amount of "air oxidation" from preheated or leakage air. Mechanisms of downward heat flow and of carbon oxidation in the bath indicate the probable effect of excess oxygen, available immediately above the bath surface, on increased absorption of oxygen from the gas phase. \$3.00 per copy. (Members \$2.00). American Institute of Mining, Metallurgical & Petroleum Engineers, 29 W. 39th St., New York 18.

"Design of Grey Iron Castings" tries to foster closer co-operation between the purchaser of iron castings and the ironfounder. 55 pp. 104 drawings. \$2.00 per copy. The Council of Ironfoundry Assns., 14 Pall Mall, London SW 1, England.

"1957 Revision Unified and American Screw Treads" is concerned with thread standards covering the Unified and American National screw threads. 12 pp. 25 cents per copy. (Free upon request on company letterhead). The Eastern Screw Machine Corp.

"Industrial Ovens and Dryers" deals with industrial fire protection. It is a guide to fire and explosion safety. 40 pp. \$1.00 per copy. Factory Mutual Engineering Div., 1151 Boston-Providence Turnpike, Norwood, Mass.

"Testing of Weighing Equipment" is a standard reference in the field of weights and measures. It is a reprint. 184 pp. \$1.25 per copy. Govt. Printing Office, Washington 25, D. C.



No winter downtime with **Keystone Aluminum Conductor System**

For two winters-and going into the third-Niagara Mohawk Power Company, Buffalo, has enjoyed troublefree service with a Keystone integrated aluminum conductor system. The system replaced one of wire used with Niagara's traveling coal storage towers.

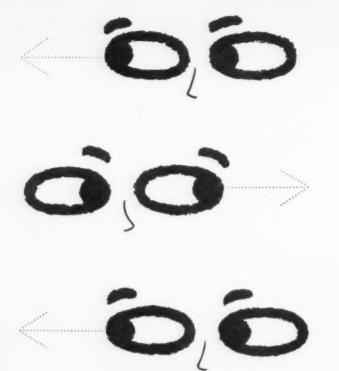
Service conditions are severe here. Ice is a big problem. Sulphuric acid fumes from coal piles cause corrosion. But with aluminum Inverted-V Keystone conductors and enclosures, these problems are solved.

Other advantages of Keystone integrated conductor systems improve operations indoors, too. Low voltage drop-rugged components-no wires to burn down. Steady operation is assured.

For further case history information and data on use of Keystone Aluminum Conductor Systems, call or write Electric Service Works, Delta-Star Electric Division, H. K. Porter Company, Inc., Philadelphia 32, Penna.



H. K. PORTER COMPANY, INC.



Alternating stresses bear watching!

Back and torth ... up and down ... in and out ... if those stresses keep changing, the life of a metal part is a hard one ... and often a short one. Stress reversals can cause "fatigue" failure at stresses far below the expected strength of the metal.

One of the outstanding properties of phosphor bronze is its high resistance to fatigue failure. It is widely used for electrical switch parts, relay contact springs, bellows, rotating shafts and other moving or vibrating parts.

For detailed information on phosphor bronze, write to

Riverside-Alloy Metal Division.

H. K. Porter Company, Inc., Riverside, N. J.

Send today for our free handbook



ALLOY METAL WIRE Prospect Park, Pa. RIVERSIDE METAL Riverside, N.J. PRENTISS WIRE MILLS Holyoke, Mass.

HKP)

RIVERSIDE-ALLOY METAL DIVISION

H. K. PORTER COMPANY, INC.

Optical Firm Produces Super-finish Metals

Optical engineers are now producing on stainless steel hemispheres surfaces accurate to between 4 to 6 microinches (4 to 6 millionths of an inch). They even expect that further refinements in the new process will lead to greater precision in the near future.

The firm, Bausch & Lomb, Optical Co., Rochester, N. Y., super-finish hard metals of spheri-



Using a magnifier, a researcher checks the fine finish.

cal, parabolic and elliptical shapes up to 36-in, diam. Experimentation on larger surfaces of other shapes is now underway.

Stimulating the firm's original interest in the new field was a request by the research and development section of Avco Mfg. Corp., Lawrence, Mass. Their engineers needed test samples for determining air flow patterns of

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 149. Just indicate the page on which it appears. Be sure to note exactly the information wanted. high velocity winds against different metal surfaces. Bausch & Lomb received from Avco six 19-in. hemispheres of rough-spun 400 series steel. Different surface specifications, ranging from 4 to 6 microinches to 180 microinches were established for each hemisphere.

Use Light Polishing Method — The firm uses a method originally developed for grinding and polishing reflectors for Army and Navy searchlights and motion picture projectors.

The super-finished hemispheres are for use as research tools at the National Advisory Committee for Aeronautics supersonic wind tunnel in California.

Hammering, Cooling Toughen Metal

Beta brass is a special alloy of almost equal parts of copper and zinc. The unique body-centered cubic substance toughens under the punishment of hammering and low temperatures.

Most BCC metals and alloys become brittle under such cold working; beta brass, though, transforms to become more workable near and below room temperatures. So states a paper presented at the annual meeting of the American Institute of Mining, Metallurgical and Petroleum Engineers in New Orleans.

How cold working produced a martensitic transformation, a temporary shift in the arrangement of the atoms that make up crystals of the metal, was described by Charles S. Barrett, professor in the University of Chicago's Institute for the Study of Metals, and T. B. Massalski, his former research associate, now at the University of Birmingham, England.

Use X-Ray Diffraction — The structural shift of the atoms was detected by x-ray diffraction, a common method of determining crystal-line formation. Crystal changes also produced streaks of

New trends in the use of refractories by LACLEDE-CHRISTY



LACLEDE-CHRISTY introduces new packaging for Refractory Specialties

For improved identification. Product and application data on Laclede-Christy's new castables, plastics, ramming mixes and bonding mortar, cartons and drums and bags are clearly visible and easy-to-read.

Improved product protection. Laclede-Christy cartons, drums and bags contain consistently high quality products securely protected during shipment and handling. Drums are sealed against weather and water.

New quality-first controls also are in effect at Laclede-Christy. They add to improved packaging as reasons why you profit by using Laclede-Christy refractory products. Your Laclede-Christy man will be glad to give you a complete report. See him soon. Laclede-Christy Division, H. K. Porter Company, Inc., St. Louis 10, Missouri.





VULCAN Tool Steels get results:

Production up, costs down

A major tool steel user—H. M. Harper Company—recently came up with a real "toughy": Dies for cold heading slotted, hard-to-work Nickel terminal screws. Harper tested steels of various analyses for the application. They found that Vulcan Special Vanadium filled the requirements exactly.

The result—terminal screws produced by cold heading process instead of milling—at very substantial increases in production and much lower cost.

Vulcan representatives like tough problems. They welcome highly-demanding tests of Vulcan tool steel superiority. They enjoy tackling a variety of problems, because Vulcan's complete line of fine quality tool steels allows them to give right answers—not "almost as good" recommendations.

A representative is nearby to serve you. Vulcan Crucible Steel Division, H. K. Porter Company, Inc., Aliquippa, Pa.





H. K. PORTER COMPANY, INC.

TECHNICAL BRIEFS

pink in the otherwise gold-colored metal. The researchers tested a variety of beta brass alloys ranging from about 40 to 52-pct zinc.

In the Chicago experiments, crystal changes could be seen readily at room temperatures, about 70°F, in beta brass containing less than 50-pct zinc. Temperatures had to be lowered to that of liquid helium, 5° above absolute zero's —273°C, to produce crystal changes in the high-zinc combinations.

All solids get their properties, such as toughness, from the arrangement of their atoms into crystal forms. In normal 50-50 beta brass, the tightly-packed atoms are in a "body-centered cubic" arrangement, with an atom at each corner, equidistant from one in the center.

Resist Severe Cooling—Uniquely, for BCC metals, severe cooling and some hammering cause the atoms of beta brass to swing into a new formation of tightly-packed layers. In the low zinc brass, the new crystal formations are the face-centered cubic of commercial alpha brass; in high zinc beta brass, the crystals become hexagonal, a formation associated with ductility, or the ability to be drawn thin.

Uses Honeycomb Panels

The nation's first supersonic bomber, Convair's B-58 Hustler, uses brazed honeycomb panels of Armco 17-7 PH stainless steel. Core material is 0.0015-in. thick. Cover sheets are mostly 0.010-in. thick but 0.005-in. and 0.008-in. thicknesses are also used.

Spun Blocks Resist High Temperatures

What do you need in insulating materials? Low conductivity and heat resistance are obvious needs. Ease of handling and installation.

are often necessary requirements.

Spun mineral wool blocks and its cement may be your answer. For Surface Combustion Corp., Toledo, the material helps squeeze the most energy from every heat unit while easing application problems.

Mineral wool block can be cemented in a single layer. This in-



Installer impales blocks over welded studs and clips them.

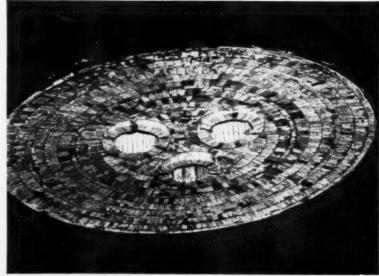
stead of using separate insulating and finishing cements. In addition, the material has low thermal conductivity and stands up to 1700°F, says the maker, Baldwin-Hill Co., Trenton, N. J. Surface Combustion uses it on atmosphere generators.

Stretch-cable Extends Power Tools' Reach

So your portable shop tool just can't reach the workpiece? Then you might try using a new electric cable that stretches. A 3-ft length of the elastic electric cable can stretch to 18 ft long.

Known as Elasticable, the cable that stretches is made in three layers. First comes a rubber-core. Around this is braided or wound the electrical conductor - usually copper wire. Glass fiber, rayon, silicone rubber or nylon covers the conductor.

Mutual Electronic Industries



An 18-ft. all-SHAMVA roof laid up for a 50-ton electric furnace melting alloy steels.

In electric furnace operations

SHAMVA MULLITE GIVES YOU OUTSTANDING SERVICE

"Shamva" Electric Furnace Roof Brick is a coarse and open type refractory, giving you the extreme spalling resistance necessary in top charge electric furnace roofs.

- High fusion point (3335°F.)
- High softening point (over 3000°F.)
- Low coefficient of expansion (3.66 x 10⁻⁶ per °C.) Anti-spalling (0.7% at 3000° F. Preheat, A.S.T.M. test)
- High load bearing strength (-3.1%, at 3000°F., $1\frac{1}{2}$ hrs., 25 p.s.i. A.S.T.M. test)
- Low heat conductivity for greater furnace efficiency

With "Shamva" Mullite Brick, roof life and production increase, down time and labor costs decrease.

Let our field engineers assist in your refractory installation.



Mullite Works. Laclede-Christy Division, H. K. Porter Company, Inc., Shelton, Conn.

Distributors in principal cities





This is the kind of super-duty job

—where Leschen Flattened Strand wire rope often outlasts others by 100% or more.

Your nearby Leschen man can give you all the facts—and service records to prove them. Your own records—after using Leschen Flattened Strand—may very well give you final proof.

Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.

H. K. PORTER COMPANY, INC.

TECHNICAL BRIEFS

Corp., New Rochelle, N. Y. developed the elastic wire. The firm is a subsidiary of Sightmaster Corp.

The cable comes with clips, jacks, or spade terminal fittings. It



Dramatic demonstration shows the cable's stretchability.

can be had in lengths to fit shop needs. It's said to last a long time.

The cable withstands the high shock loads and vibration and shows good resiliency. It's neither bulky nor awkward to handle.

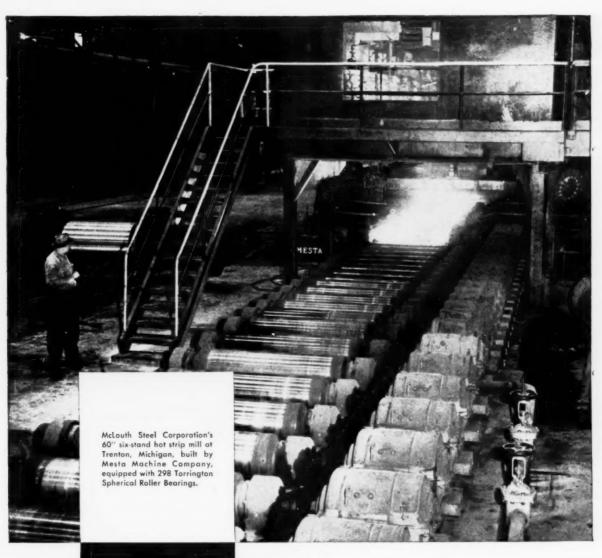
Move Difficult Loads

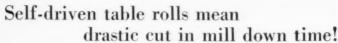
Effective industrial truck handling is not restricted to conveniently palletized loads or ones carried in standard containers.

At Midland Steel Products Co., Cleveland, seemingly difficult to handle components for frames for passenger cars, buses and trucks, are easily handled in specially designed skid mounted carriers. These measure 40 in. wide, 66 in. long, and 72 in. high. For smaller components, the carriers use expanded metal sections to retain the loads. The company uses a fleet of Elwell-Parker industrial trucks both within the plant and in yard storage areas.

Material Makes Battery Containers Stronger

Industrial storage battery cell containers and covers made from a new material are less apt to break than others. So states C & D Bat-





It was a new idea. Suppose mill approach and runout table rolls had their own independent motors and pillow blocks instead of conventional gearing and line shafts? Then any roll could be removed for maintenance and replaced immediately by a stand-by assembly without shutting down the whole table for hours!

Torrington engineers, working with Mesta engineers, came up with a design mounting Torrington Spherical Roller Bearings in Torrington-built fixed and floating pillow blocks. These bearings compensate for misalignment across the table and for dynamic deflection of the rolls under load. In both roughing and finishing mill tables, 298 Torrington Spherical Roller Bearings have been operating efficiently since 1954!

The Torrington Company, with experience in the manufacture of every major type of anti-friction bearing, has made thousands of installations in steel mill equipment that have helped roll record tonnages. Your Torrington engineer is an expert: call on him when you need help. *The Torrington Company*, South Bend 21, Ind. – Torrington, Conn.

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

3 ways to reduce costs



PERMANENT MAGNETIC EQUIPMENT FOR METALWORKING PLANTS

USE HOMER "SPACE-SAVER" MAGNETIC CONVEYORS...

To increase production speeds and automatic handling of ferrous parts and pieces.

Convey up or down inclines as steep as 90° without belt cleats . . . at belt speeds up to 250 fpm. Parts and pieces held securely during conveying—no slipping or loss of parts . . . no contact between parts or jamming in flapper gates to damage critical finishes. Available in 85 standard sizes, plus special models engineered to solve such difficult problems as parts turn-over applications, multi-story conveying or floor pick-up.



USE HOMER MAGNETIC SHEET SEPARATORS...

To speed handling of round, square, irregular or nested steel shapes in shearing, pressing or other production operations.

Automatically separate stacks of oily, polished, enameled or painted sheets without prying, scratching or marring the surfaces.



USE HOMER MAGNETIC SWEEPERS...

To cut plant housekeeping costs by quickly and easily keeping aisles, loading areas and roadways free of ferrous scrap.

Homer Magnetic Hand Sweepers in sweeping widths 12" to 48". Homer Magnetic Road Sweepers in sweeping widths 48" to 96".



HERE'S HOW TO OBTAIN COMPLETE DETAILS—JUST CLIP THIS HANDY COUPON TO YOUR LETTERHEAD, INCLUDE YOUR NAME AND DEPARTMENT AND SEND TO HOMER.

- ☐ Please send me Bulletin MC-250, describing Homer "Space-Saver" Magnetic
- Please send me Bulletin SS-210, describing Homer Magnetic Sheet Separators.
- Please send me Bulletin MS-250, describing Homer Magnetic Sweepers.

THE HOMER MANUFACTURING CO., INC.



THE FINEST IN PERMANENT
MAGNETIC EQUIPMENT FOR INDUSTRY

TECHNICAL BRIEFS

teries, Inc. of Conshohocken, Pa.

The new material is a joint development of the firm's research department and those of major rubber companies. It replaces pres-



This is what doesn't happen to the new battery case material.

ent standard materials in the company's line for industrial trucks and mine batteries.

As a result of using the material, damage to battery cells, from dropping, collision between trucks, or from the impact of heavy objects falling on the battery is practically nil

In a typical test, a battery cell with a container and cover made of conventional materials was struck with a four-pound maul. It was smashed and cracked. A cell, with the container and cover made of new compound was struck the same way—without a sign of breakage.

Hold Annual Meet

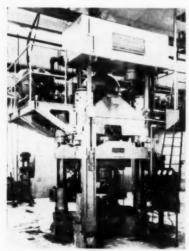
The fortieth annual conference of the National Open Hearth Steel Committee in conjunction with the annual meeting of the Blast Furnace, Coke Oven, and Raw Materials Committee of the American Institute of Mining, Metallurgical, and Petroleum Engineers will be held at the Penn-Sheraton Hotel, Pittsburgh, April 8-10.

On the agenda is a comprehensive program dealing with the operation, metallurgy, and physical chemistry of open hearth furnaces. The theory and operation of blast furnaces, and coke and by-product plants will also be featured.

Press Stamps, Forms **Radioactive Metals**

If the problem of stamping and forming radioactive metals has been bothering you, you can stop worrying. The problem appears well in hand.

Already such a press is being built. It's intended for forming and shaping radioactive materials by remote control. Dow Chemical Co. will operate the press for the



Special presses, similar to this one, form "hot" materials.

Atomic Energy Commission at its atomic weapons plant in Rocky Flats, Colo. It's part of an \$18 million expansion program out there.

The press works in a completely sealed chamber. It combines the Guerin rubber-pad forming process with conventional steel-die forming. The male die is steel. A rubber pad replaces the female die. Loewy-Hydropress Div., Baldwin-Lima-Hamilton Corp., Philadelphia, developed the press.

Less Wear-The firm claims the combination rubber pad-steel die NEW DESIGN

MANCO Hydraulic Guillotine®





MODEL MC 210 Capacity $\frac{1}{2}$ " High spee . . . $\frac{1}{2}$ second per cut for steel rod to $\frac{1}{2}$ " Full swivel action.



MODEL MC 35 Capacity 1" MODEL MC 33 Capacity 1... Cuts high carbon material including teln-forcing rod and heat treated chain to 1... diameter in 11/4 seconds per cut.



AODEL MC 65 Capacity 1 1/4" Cuts 114" diameter steel in 2 seconds per cut. Can be madified to cut 115" diameter

20 HV-

Big Time and Money Saver for Rod Mills and Users of Wire and Rod

Ideal for production cutting, trimming off cobbled ends, taking test samples and splitting bundles on

Manco has completely redesigned the Guillotine line of wire and rod cutters now used by major rod mills throughout the world. These new Manco Guillotine units give high efficiency, heavy duty performance, with a 75% slash in tool maintenance costs.

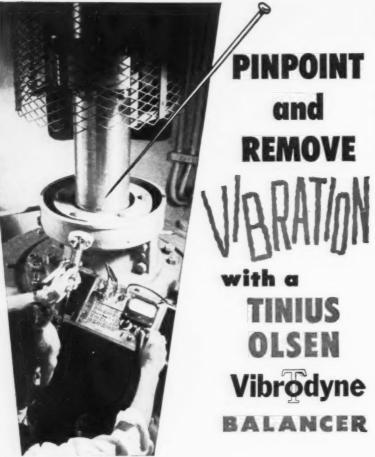
New Interchangeable Blade and Anvil

Interchangeable blade and anvil means wear points can be reversed for virtually double life. Three blade styles for various cutting requirements. There is a new simplified valve design with hardened and ground parts for longer life. Also, new Meehanite piston with large bearing surface and a new piston seal assembly that permits quick replacement.

____Zone.....State...

These Guillotine units powered by Manco Hi-Thrust Electric Hydraulic Pumps

Write for Comp	lete Information IA-3-B
	MANCO MFG. CO., Bradley, Illinois Please send:
WRITE FOR CATALOG	☐ Catalog of new Guillotine Wire and Rod Cutters. ☐ Trade-in Information on Guillotine model(s)
Important Note: Also ask about trade-in offer	
on old model 200 HV-2L,	Name
20 HV-1 and 21 HV-2L	£1



In-place balancing of a large vertical generator.

For final check balancing of rotating assemblies, or for locating and removing mechanical vibration in installed equipment . . . you will do the job quicker and easier with the Tinius Olsen Vibrodyne.

This highly sensitive in-place balancer isolates the source of mechanical vibration for accurate detection and correction. Unlike other balancers, the Olsen Vibrodyne employs a tunable pickup. With a simple turn of its frequency control, the Vibrodyne becomes super sensitive to unbalance at the operating speed of the part in the range of 225 to 3600 rpm, using the standard pickup. Extraneous vibrations are effectively eliminated—assuring a finer, more accurate degree of balance. In fact, with an Olsen Vibrodyne, you "start" to balance where other units "stop."

Get the full story. Write today for 12-page Bulletin 53.



WILLOW GROVE, PA.

Testing and Balancing Machines

TECHNICAL BRIEFS

technique cuts die wear substantially. Die replacement is needed less often. The surface shaped by the rubber mat retains its finish. Thin sheets can be deep drawn without wrinkling. Tooling cost is said to be

The airtight chamber is stainless steel and clear plastic. It shields workers against contamination. Long rubber gloves built into the chamber permit manual operation and adjustment when needed.

The Marform press can control blank holding pressure precisely throughout the draw, it's reported. This enables forming of tapered and other complex shapes in one operation.

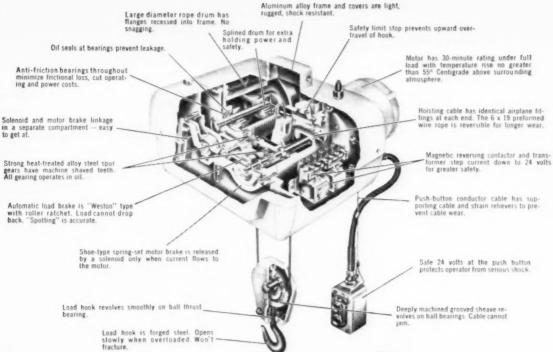
Castings Resist Wear, Impact, Temperature

Extreme heat, abrasion, and smashing impact in service can mean real trouble if you use cast parts. Yet you may be reluctant to change your way of making the component. Perhaps cast parts offer real advantages you hate to part with

If so, consider high alloy castings. They may work as well for you, as they now do in parts for cement production equipment. Alloy Casting Institute considers such service typical of that where high alloy castings fit well.

Cement mill equipment must withstand corrosion from continuous or intermittent service above 1200°F. Such corrosive attack causes heavy scaling and eventually reduces the load capacity of exposed structural elements. This scaling is particularly harmful in the rotary kiln.

The rotating kiln is one of the world's largest pieces of moving equipment. It measures up to 500 ft long and 12 ft diam. In these huge kilns, cement ingredients heat to almost 3000°F. Metal parts reach as high as 2000°F.



TOP QUALITY SPELLS TOP PERFORMANCE FOR YOU

This is the Series "600" 'Load Lifter', the tough wire rope electric hoist with a well-earned reputation for speeding production. The $\frac{1}{2}$ -ton size lifts at 30 FPM at the push of a button. Only 24 volts at the push button means a big plus in safety.

The "600" has few functional parts and has anti-friction bearings throughout. That means less wear and lower power and operating costs—economy! Strong construction is combined with lightness for stamina and easy movement on the I-beam. Your service man won't see much of this hoist, yet every part is easily accessible by removing covers while the hoist is in the air!

Check the construction of the Series "600" 'Load Lifter'. Compare its quality, performance and low headroom with other makes. You will be convinced that here is the best value in its class. ½ and 1-ton capacities available in lug or hook suspension or with plain or motor-driven trolley. Your "Shaw-Box" Distributor will gladly give you full details — or write us for Bulletin 408.





Load Lifter ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.

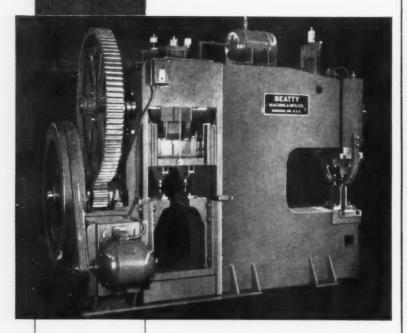
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Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves. 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

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BEATTY NO. 7 DETAIL BEAM PUNCH

New Detail Beam Punch Speeds Single-Hole Punching





Web Punch End One



Flange Punch End Two

In just three passes, instead of the usual five, this Beatty Detail Beam Punch punches flanges on either side of the webs of beams, as well as webs of beams, angles, channels and plates - eliminates the endfor-end turning of beams.

Incorporating an entirely new design that speeds single-hole punching, this compact new punch saves floor space and reduces your equipment investment by handling the work of three ordinary machines. Mechanically driven, it is of 100-ton capacity, open-throat and guillotine type, and will punch up to a 11/4" hole through I" mild steel.

Write For Full Details



MACHINE & MFG. CO.

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Beam (Flange) Punch





TECHNICAL BRIEFS

They cast the kilns' ends to resist these conidtions. Both feed and discharge ends of rotary kilns are built of cast high alloy segments. They retain the fire brick that lines

Heat-resistant casting alloy of the iron-chromium-nickel type will



Cast alloy segments form the kiln's discharge end.

withstand such service. Such castings contain 19 to 32 pct chromium and 8 to 22 pct nickel. (ACI types HE, HF, HH, HI, HK and HL fall within these ranges.)

Partially ferritic or fully austenitic, these high chromium alloys have greater high temperature strength and ductility than straight chromium types. They also can withstand greater loads and temperature cycles. The alloys stand up in sulphur-bearing, oxidizing and reducing atmospheres.

Stand Heat - High alloy types HH and HK are recommended for cement mill applications because of their high heat resistance and impact and abrasion resistance. One mid-western manufacturer reports that of 69 kilns equipped with type HH and HK alloy castings no replacements have ever been required. Some of these kilns, located in 15 different plants, date back to 1944.

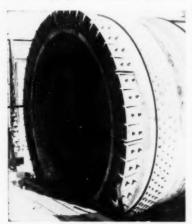
The HH alloy can be cast as a

partially ferritic or wholly austenitic structure. The ferritic casting provides high hot ductility. austenitic grade gives high hot strength.

Most cement mills use the austenitic grade to avoid possible embrittlement of the partially ferritic type. This can occur from sigma phase formation. The austenitic grade normally does not show stress cracking even in long and severe service.

Properties of the HK alloy resemble those of the HH type. Despite its wholly austenitic struc-

Less Warpage-One kiln maker, Basic Inc., Maple Grove, O., reports several advantages from use of high alloy castings (type HH) in segmented kiln discharge ends: first, warping is reduced. Segmental



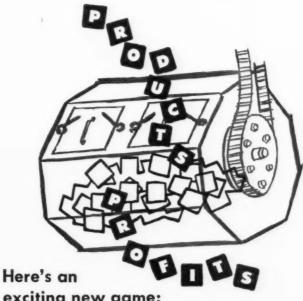
Rotary kilns use alloy castings at critical points.

design allows for expansion and contraction of the kiln end without permanent set of the kiln shell.

Second, segments completely shield kiln ends from the clinker. Yet, effective operating length of the kiln is not shortened.

Third, installation is easier, since no special brick-work is needed. Segments bolt on the inside of the kiln to provide a perfectly flush surface for the brick lining.

Each segment weighs about 35



exciting new game:

PUT your products in the barrel TAKE your profits out

One of the greatest money-saving opportunities in metalworking lies in the use of barrels to finish parts by the hundreds in place of conventional methods that finish one part at a time.

Barrel finishing makes easy work of many tough jobs of grinding, deburring and buffing by wheel.

One Oakite customer changed to barrel methods to deburr curved stainless steel strips that are 14 inches long. The cost for deburring 20,000 strips was reduced from \$3,000 to \$125.00.

FREE For a copy of "Precision Barrel Finishing" -containing valuable information on cutting down, deburring, descaling, and burnishing-write to Oakite Products, Inc., 30H Rector Street, New York 6, N. Y.





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TECHNICAL BRIEFS

lb. This simplifies replacement if needed.

Last 15 Years—Basic Inc. reports cast high alloy kiln ends have lasted up to 10 times as long as "bricked-up" kiln ends. In one case a segmented kiln end served 15 years.

High alloy castings also find use

in cement clinker cooler grates. After the feed material passes through the "clinkering zone" of the kiln, it discharges onto cast high alloy grates to cool. This cast grating provides a heat-resistant, strong, rigid surface that withstands 2000° to 2200°F clinker. The grating stands up under severe

impact loads as the clinkers drop from the kiln.

Cold air blows through the grates to cool the clinkers. The high alloy castings stands the thermal shock of the air blast well.

Partially cooled clinker moves to a dryer via a drag chain also of HH cast alloy. This chain resists temperatures up to 1500°F, as well as abrasive wear.

Paper Protects Plate

Cleanliness is important in a plant that fabricates aluminum for tank car use. So states O. H. Kuhlke, welding engineer of General American Transportation Corp.

Describing work at the firm's Sharon, Pa., plant, he says that in some cases surfaces get protection from contamination with foreign particles by plastering a cheap grade of wallpaper to the aluminum. This serves as protection through the various processes until the material reaches the weld shop. Here, the welders strip back about 12 in. on both sides of the weld joint.

The engineer's comments were presented to a recent Chicago conference, sponsored jointly by Illinois Institute of Technology and the Chicago section of the American Welding Society.

Stainless Steel Balls Aid Bridge Building

Stainless steel balls 11½ in. diam find use in highway and rail-road bridges. Lower construction cost, simpler design and better appearance are reported.

The balls are used in joints at the top and bottom of bridge support columns in some new designs. Bridges on the Indiana Toll Road have such joints.

In most cases, two ball-joint columns replace either one huge concrete pier or two smaller piers. The columns take less space be-



Manufacturing Plants in Bedford, Ohio and Jasper, Georgia
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RUBBER COMPANY

DSC Electro-Welded Wire Fabric Makes Concrete Crack Resistant



DSC PHOTO
This is a new highway between Detroit and Toledo. Reinforced with DSC Fabric, it will shrug off the beating it will get from heavy traffic and extreme weather conditions.



This concrete slab (DSC Fabric-reinforced) will help keep the new building livable longer by guarding it against cracks,

leaks, vermin and other destructive forces



Courtesy Lamar Pipe & Tile Div., American Marietta Corp.

Here is a giant-size section of a DSC-Fabric-reinforced 120" LO-HED concrete pipe. The nation's pipe mileage is steadily lengthening for sanitary and storm sewers, highway and railroad culverts and for drainage uses generally.

...puts lasting strength in pavements, structures, pipe and other precast concrete products

DSC Welded Wire Fabric—sometimes called "mesh"—is "woven" at our Portsmouth (Ohio) mill. Its "fibers" consist of Portsmouth Bright Basic Low Carbon Reinforcing Wire.

The "warp" and "woof" intersections are electrically welded. That way the mat virtually becomes a continuous lattice-work.

Here, again, the PROOF of the FABRIC is in its PER-FORMANCE . . . its ability to impart the necessary tensile strength to the concrete to resist estimated stresses and strains. The important factors are sound welds and conformity of wire quality, sizes, spacings and overall dimensions to the engineering specifications.

Your nearest DSC Customer "Rep" will give you further information on Welded Wire products and their uses ... or on other DSC Rod and Wire products or on Sheet and Strip steel.

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DETROIT MILL DIVISION, DETROIT, MICH.
EASTERN MILL DIVISION, HAMDEN, CONN.

Cold Rolled Carbon Steel Strip Flat Cold Rolled Carbon Spring Steel

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TECHNICAL BRIEFS

tween railroad tracks, and roadways. A shorter, less-costly bridge results.

Move Easily — Supporting columns must be free to move in all directions. You should design to withstand side wise forces, as well as end-to-end forces. The ball-joint columns provide this freedom of movement without subjecting the columns to high bending stresses.

Industrial Tectonics, Inc., Ann Arbor, Michigan, made the balls, in diameters of 6", 8", 10". They weight 230 lb each.

Balls are hot-forged Type 410 stainless steel. They are hardened to about 240 Bhn. Grooves in three directions hold graphite paste lubricant.

The two bearing plates are structural steel hardened to 140-150 Bhn. Their hemispherical sockets are machined to a radius 0.01 in. larger than that of the ball.

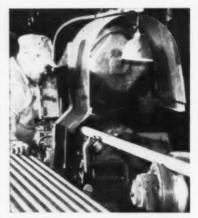
Magnetic Pipe Rolls Cut Maintenance

Permanent magnetic pipe rolls cut maintenance for one plant. They also save power and improve safety conditions.

Six of these magnetic pipe rolls are part of three automatic pipe facing machines at Wheeling Steel Corp., Benwood, W. Va. They reduce the required number of motor-driven cast rolls from 25 to 6. The units also eliminate personnel contact with the pipe in this operation.

Handle Work Quickly — The non-electric magnetic equipment are special pipe control and conveyor rolls, produced by Eriez Mfg. Co., Erie, Pa. They convey ½ to 3-in. pipe between the facing machines at a rate of 2000 21-ft pieces per hour.

Motors subject to rough usage common to such equipment need



Magnetic conveyor rolls feed pipe to machining operation

almost constant maintenance; doing away with 19 motor-driven cast rolls results in a considerable increase in efficiency.

Since the magnetic rolls eliminate

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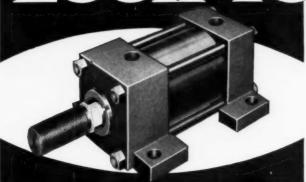
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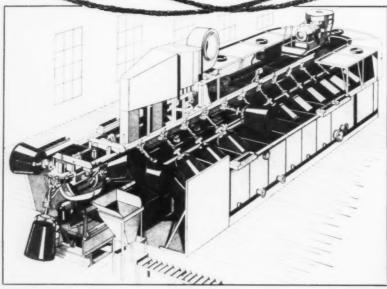
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TECHNICAL BRIEFS

bounce and slippage, manual pipe handling is nil. The potential hazards of this work thus have ceased.

One Piece Conveyor To Carry Ore

One of the largest one-piece conveyor belts yet made will see ore-handling service soon in Venezuela. Over 1,000 ft long and 60 in. wide, the belt will move ore for Orinoco Mining Co., a U. S. Steel Corp. subsidiary.

The 22½-ton belt is multiplied of rayon with nylon filler. This combination makes the belt as strong as steel cable; it permits loading the belt to tensions up to



Engineer measures the 1000-ft long, 60-in. wide belt.

200 psi inch of width per ply. An abrasion resistant cover withstands cutting and gouging by sharp pieces of iron ore.

The belt can carry iron ore at 6,000 gross tons per hour or 100 tons per minute.

Underground crusher—A 1,250 hp motor drives the belt, to carry ore from a crusher, 100 feet in the ground to the head of a second crusher. The conveyor works at Puerto Ordaz, the river shipping port for the Cerro Bolivar iron ore deposit.

The long single belt has several advantages. They include (1) elimi-

nation of transfer points, (2) lower installation and maintenance costs and (3) longer belt life. This last since loads on longer belts are deposited less often at any given point on the belt, according to the supplier, International B. F. Goodrich Co., Akron.

Belts made with nylon filler have high flexibility. This helps for better troughing and improves impact resistance. Nylon provides high cross wide strength in belts, and an improved base for holding mechanical fasteners. Belts are said to cost no more than standard cottonfabric reinforced ones for both low and high load service.

School Gets Welder

When a school can't afford necessary lab equipment, private industry must take the initiative. A sample of this is a 15-ton, \$40,000 flash welding machine now in the welding lab at Renssaler Polytechnic Institute, Troy, N. Y. Sciaky Bros., Inc. of Chicago lent the unit to the institute. Its purpose is to encourage and assist the school in its research on flash-butt welding.

Comments L. W. Houston, RPI president. "This new and costly facility well illustrates the important part industry can play in equipping the technological laboratories of the colleges. This machine will prove highly useful in teaching as well as research, but its purchase price would overtax our funds budgeted for buying laboratory equipment."

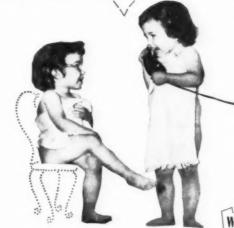
Researchers Seeking Oil-free Bearing

At subzero temperatures the oil in conventional small bearings congeals and interferes seriously with instrument performance. To help eliminate this difficulty, the National Bureau of Standards investigated several varieties of materials for possible application as oil-free bearings in clocks and similar mechanisms used aboard aircraft.

The study reveals a number of materials that promise acceptable performance over a considerable part of the temperature range in which aircraft instruments must operate. Besides eliminating the difficulty due to congealing, oil-free bearings would also do away with the need for periodic cleaning and oiling during storage and service.

Congealing Poses Problem—The increased viscosity and congealing of oils at subzero temperatures interfere with lubricated bearings by producing excessive friction. In some devices the added friction can be overcome by providing extra driving power. In the case of aircraft clocks and similar jeweled

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1.4-3



PLANT SUPERINTENDENT, THE CINCINNATI GEAR CO.

Some of the men here look on me, I'm sure, as a modern Simon Legree with a nine-foot bullwhip — which isn't really a true picture at all. In fact, I think I'm pretty easy to get along with.

But there are times when I think this job of plant superintendent calls for someone with the attributes and physical characteristics of a two-headed monster. To keep track of a couple hundred different men, working on almost as many different jobs and different machines, all involving a high degree of skill and exacting accuracy, requires something more than mere attentiveness to duty. It means I have to constantly put forth an extra effort to do a top-notch job.

Not that I'm trying to brag about myself; my job is tough and sometimes it seems thankless, but it has its compensations. And one of the most important of these compensations is the satisfaction of knowing that my efforts are not being wasted. Because everyone elie here is "putting out" to do his part too, with the result that we have a top-notch Company turning out a top-notch product — something that our customers have come to expect from us as a matter of course.

THE CINCINNATI GEAR CO.

Fifty Years of "Gears-Good Gears Only"



TECHNICAL BRIEFS

instruments, however, this is not feasible.

The Bureau's study therefore concentrated on materials for oil-free bearings in timepiece mechanisms, and investigated them over the temperature range from -60° to $+75^{\circ}$ C.

Bearing materials of 81 different compositions were investigated. Some of these were more intensively tested than other materials.

Stainless Oil Coolers On Coming Automobiles

Stainless steel oil coolers will be used on part of Ford's production this year.

The oil cooler is an envelope of metal about 7-in. long, 1½-in. wide and ½-in. thick. It operates as a small heat exchanger in its location in the radiator's bottom tank. Under pressure, searing oil forces through an inlet and outlet metal



Cutaway view shows inside of stainless steel oil cooler.

tube. Cooled oil spurts out the outlet side; it then returns to the transmission.

The switch to stainless follows two similar changes to the metal for functional parts. Allegheny Ludlum Steel Corp., Pittsburgh, says that other cars will use stainless steel functional parts in top and bottom radiator tanks and for expander oil rings on pistons.

Not Hard To Get—The McCord Corp., manufacturer of radiators



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• Ohio Crankshaft's Tocco Division plant is meeting higher production goals with help from Reading Electric Hoists. The new plant was designed with a Reading Hoist "custom-built" into the plans. Write for our latest bulletin "The Why and How of Faster Production".

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Branch 3042-3058 W. 51st Street, CHICAGO, ILL. Phone: Grovehill 6-2600 and oil coolers, and Ford Motor Co. decided on stainless after extensive research. By changing, they expect to make a savings on each unit. However, one of the main factors in making the change is that the new oil cooler uses no hard-to-get metal. It won't get scarce in an emergency. The oil cooler is made of type 430 stainless.

Type 430 is a high chromium stainless steel. It is corrosion resistant at elevated temperatures and is ductile.

Oil coolers are necessary only on automobiles using automatic transmission.

Setup Descales Parts, Doesn't Damage Them

After years of harassment, a large fabricating firm is solving the problem of removing scale from titanium parts without damaging the material.

The titanium fabricator, Temco Aircraft Corp., Dallas, Tex., now removes tough oxide scale from parts through electrolysis. This method was settled on after several other processes were tried. These failed to meet the company's standards; parts rejection proved costly.

Involves Hand Labor — Some methods in volved considerable hand labor and expensive installations. In many cases, acid baths removed the scale, but etched the metal underneath unevenly. Where no scale was present, such as on edges of newly-punched rivet holes, such etching made the parts unusable by elongating the holes.

Scale lowers corrosion resistance of titanium, makes inspection of parts difficult and sometimes hastens metal fatigue.

Process Not New — The electrolytic process involves running an electric current through the titanium while it is immersed in an acid solution. Although electrolytic proc-

esses themselves are not new, being used for such things as silver and cadmium plating, the firm's research led to this descaling method for titanium.

The process eliminates expensive heating equipment for molten salt solutions. One man now handles an operation that formerly required eight and involved much

hand-scrubbing of parts between immersions of the material in acid pickle.

Method Cuts Rejects — The method reduces rejection of parts due to unevenly etched surfaces.

The company now descales machined parts so delicately that machining marks are still visible on the metal after processing.



... even for steel shapes and sizes that couldn't be austempered or martempered satisfactorily before

The quenching power of molten salt at 400° F, and above is tremendously increased by the rushing flow created in this unique Ajax "Cataract" furnace design. As a result, any steel that can be hardened satisfactorily by an oil quench can now be martempered or austempered in salt—with all of the salt bath advantages.

These include more uniform hardness; so little distortion that parts can usually be finish machined *before* hardening; elimination of quench cracks; and increased toughness and ductility. Also, like all salt baths, Ajax Cataract Quench Furnaces are readily mechanized.

AJAX ELECTRIC COMPANY 904 FRANKFORD AVE. PHILADELPHIA 23, PA.

Associates: Ajax Engineering Corp.

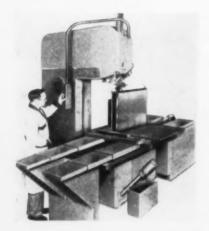
Ajax Electrothermic Corp.



WRITE for Ajax Martempering and Austempering case history bulletins.

New Production Ideas

Equipment, Methods and Services



Band Mill Machines Large Blocks Of Die Steel

This band mill extends band machine advantages to large work-pieces that have hitherto been restricted to planers and milling machines. The equipment machines large blocks of even the toughest die steel. It crops, slabs and faces large billets, refaces or shanks forging die blocks, splits bearings, rips heavy plate and performs similar operations. Metal can be salvaged by removal in large usable sections with the unit. If these are expensive

alloys, savings could be considerable. Fixturing is fast and simple, due to the inherent nature of band machining. Setup time takes minutes for most jobs. The band tool reduces only a narrow path to wasted chips. Small chip production results in little power consumption and high production at the same time. The band mill is a heavy, extremely rigid machine. It uses 2-in. saw blades. (The DoAll Co.).

For more data circle No. 39 on postcard, p. 149

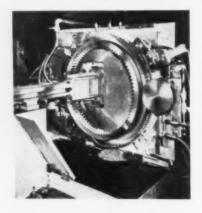


Anchor Holds High Pressure Tubing

An improved welding neck anchor forging solves the problem of how to satisfactorily anchor high pressure oil and gas pipelines. The forging takes the form of a double hubbed flange with no belt holes. This may employ a bearing plate to distribute the load. The hubs, of the straight taper type, are butt-welded to the pipe where it is to be held immobile. Then, workers bury the assembly in a reinforced concrete block of suitable dimensions. The

welding neck anchor forging comes in any of the materials customarily used for flanges. It is available in sizes to match any pipe dimensions, and for the usual pressure conditions. The product helps to protect valves and other compressor station equipment from possible damage. It permits 35,000-psi minimum yield strength material to join with 52,000-psi strength pipe without overstress. (Tube Turns Div.).

For more data circle No. 40 on postcard, p. 149



Machines Broach Oversized Spur, Helical Gears

Fixtured to accept very large gears, this universal horizontal-broaching machine broaches either finished spur or semi-finished helical gears in a range of sizes up to 42-in. pitch diameter. Set up to cut a tractor steering gear, the machine reduces the tooth cutting time from an all-day job to 1½ hours. This includes 10 minutes for loading and unloading and 10 minutes for reversing the broach. In this applica-

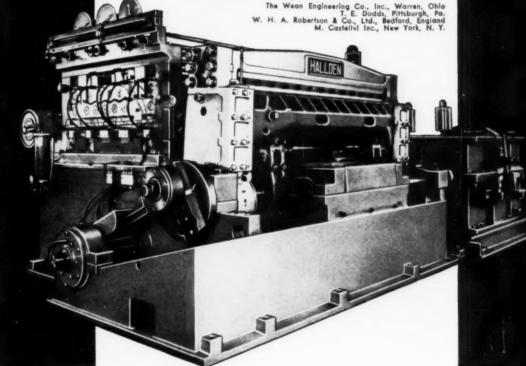
tion, it broaches three parts: a 65-tooth gear having a helix of 20° and a 12.5-in. PD with a length of cut of 4.5 in., a 79-tooth helical gear with a 26.33-in. PD and a length of cut of 4.5 in., and an 84-tooth straight spur gear having a 42-in. PD and a length of cut of 4.37 in. Gears are broached in two passes. Shaving afterwards is unnecessary. (Colonial Broach & Machine Co.). For more data circle No. 41 on postcard, p. 149

FLEXIBLE DESIGN CUTTING ACCURACY CONTINUOUS FEED RUGGED CONSTRUCTION

Automatic Shears

THE HALLDEN MACHINE COMPANY THOMASTON, CONNECTICUT

Sales Representatives The Wean Engineering Co., Inc., Warren, Ohio T. E. Dodds, Pittsburgh, Pa. W. H. A. Robertson & Co., Ltd., Bedford, England M. Castellvi Inc., New York, N. Y.





Hydraulic Contour Grinder Has Tracer Control Equipped with standard flat ret-wise" on the carriage and swive wheels dressed to very simple radii. 110° with the tracer stylus. To

Equipped with standard flat wheels dressed to very simple radii, this contour grinder automatically grinds intricate corners, both internal and external. Its variable speed work head also makes polishing and buffing possible. A swiveling grinder spindle mounts on the tracer slide. This spindle swings a 180° arc. The tracer slide mounts "tur-

ret-wise" on the carriage and swivels 110° with the tracer stylus. The machine's bed is 121¾-in. wide. The spindle will accept 1¼-in. diam bore and from 3½ to 8-in. diam grinding wheels. The head stock range is from center to 39-in. on outside diameter work. (Industrial Tool Engineering Co.).

For more data circle No. 42 on postcard, p. 149



Gasoline Powered Unit Features Easy Maintenance

Of 4000 lb capacity, this gasoline-powered fork truck features complete maintenance and operation accessibility. In addition, the new model incorporates many of the features of electric fork trucks. Some of the accessibility features include: (1) easily replaceable clutch, (2) removable seat and side-plates, and hinged hood, (3) easy access to operator's seat from either side of truck, (4) control valves providing precise control of hoist and tilting operations are conveniently located, (5) all instruments face-up, providing full vision at all times, (6) quick tire replacement, and (7) drive axle has top and bottom inspection covers. (The Mercury Mfg. Co.).

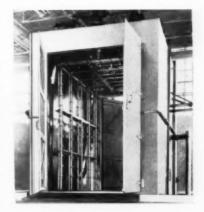
For more data circle No. 43 on postcard, p. 149



Processing Unit Uses Traveling Wash Carriage

This fully automatic cabinet type machine features a "traveling wash carriage" for cleaning and processing large, odd-size metal products. For cleaning, the machine uses automatically-timed wash and rinse cycles. These are pre-set for any desired time period; the operation is automatic. A signal light indicates when the operation is completed. Cleaned at an elevated temperature, the hot parts or products dry quickly on removal. Combination cleaning and phosphate coating materials may be used in the wash tanks; a small amount of chromic acid added to the rinse water provides a basic treatment that makes an excellent bond for paint. Separate wash and rinse piping assemblies mounted on reciprocating carriages supply full spray coverage. (Alvey-Ferguson Co.).

For more data circle No. 44 on postcard, p. 149

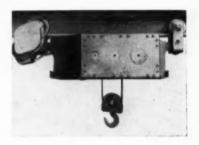


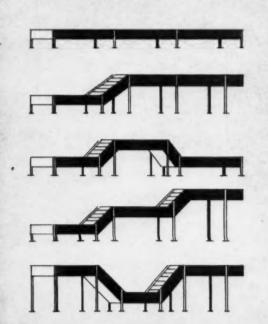
Hoists Feature Low Headroom, Precision Control

Recently introduced hoists require 37 pct less headroom over older models. They also offer precision load control to within 0.008 in. The redesigned hoists come in capacities from 3 to 15 tons. Special purpose hoists have capacities from

20 to 150 tons. During load-control tests, using a dial indicator arrangement, it was possible to achieve positioning accuracy of 0.002 in. with capacity loads. (R. G. LeTourneau,

For more data circle No. 45 on postcard, p. 149





Here is a conveyor program designed for the unusual. NOW . . . you can have a customized conveyor today to meet production needs . . . and with modification, that same conveyor will meet the needs of tomorrow.

The May-Fran conveyor standardization program provides the standard components that can be assembled to form a special or standard conveyor. These same components can be re-arranged at any time to solve production problems in the future.

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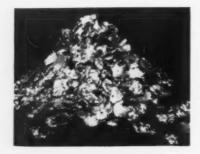
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and in the FUTURE!

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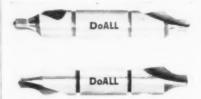
Zirconium Now Comes In A New Form: Platelets

Reactor-grade and commercialgrade zirconium now comes in the form of platelets, irregular flakelike pieces about the size of dimes and quarters. The platelets are nonpyrophoric, non-hygrosopic, and extremely pure. Since they are classified as metal, rather than metal sponge, they are completely safe to handle, and are subject to none of the restrictions necessary for handling the sponge form. The Interstate Commerce Commission requires that zirconium sponge be shipped in packages of not more than 75 pounds, wrapped in polyethylene, blanketed by argon, and packaged in single-trip sealed metal drums. None of these restrictions apply to platelets. (U. S. Industrial Chemicals Corp.).

For more data circle No. 46 en postcard, p. 149



Safety center drills feature reduced production costs and longer drill life. Their design eliminates a fatigue point and consequently re-



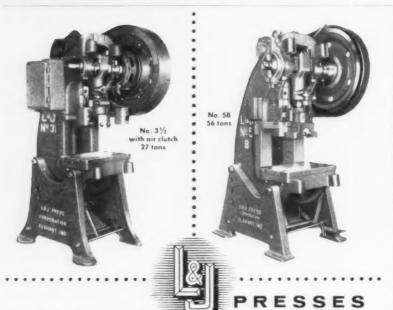
duces drill breakage. By cutting back the corner and creating a larger oil reservoir, lathe center damage is also minimized. (The DoALL Co.).

For more data circle No. 47 on postcard, p. 149

Setup Bends Pipe

One-shot portable benders bend 8-in. pipe, and larger sizes, to any degree up to 90° in one single setting. It takes 3 minutes actual bending time, with a 2-hp motor pump, to make a 90° bend in the field on 8-in. pipe. It can also be used with a 1/2-hp motor or gasoline motor. The frame folds together onto the top of the hydraulic ram, making it easy to assemble or disassemble and practical for transportation from shop to job, or vice versa. Streamlined built, they are light in weight. (Tal Bender Equipment Co.).

For more data circle No. 48 on postcard, p. 149



Ruggedly built punch presses that bring economies to a wide range of work. There is speed when it can be used . . . accuracy and rigidity to hold tolerances and give long die life . . . minimum maintenance ... and widegap models for big dies. The balanced design and quality construction of L&J Presses also insure dependability that can help your production. It will pay you to find out how you can get faster output at lower costs.

Speed Output

Reduce Costs



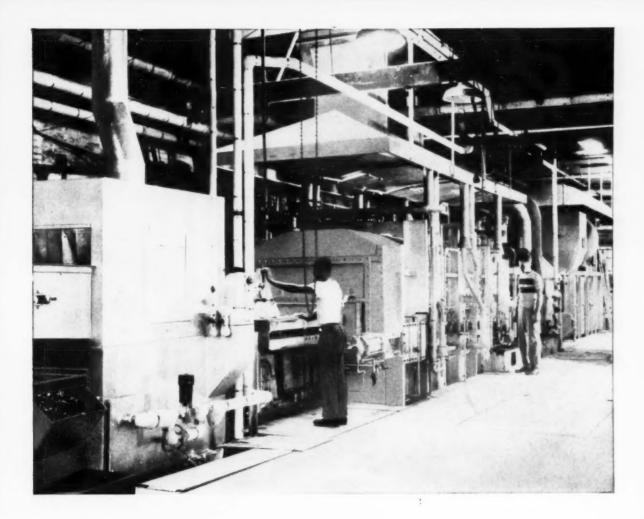
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Crank, High Speed,

Straight Side Press

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Many things improved when two of these Surface lines were installed by a fastener manufacturer: production (up 500% over previous methods), delivery time, and product quality and uniformity. Either large runs, up to 50,000 fasteners, or small batches of special parts are processed economically. All operations—weighing, loading, first wash, clean hardening, quench, second wash, draw, and rust-proofing—are tied together by timed conveyors and feeders. Surface RX® generator gas permits carburizing as well as clean hardening.

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- Certified zinc electronic housing, as cast, commercial trimmed,
- Aluminum die cast portable tool, marresistant Velvaglaze[®] finish.



* Velvaglaze and Spectraglaze are Trade Marks of

MONARCH ALUMINUM MFG. COMPANY-9205 DETROIT AVENUE-CLEVELAND 2, OHIO-OLympic 1-1700 MANUFACTURERS OF: Aluminum Permanent Mold Castings • Zinc Die Castings • Aluminum Die Castings • Exclusive Velvaglaze Finishing • and Spectraglaze, colorful Porcelain Enamel on Aluminum Permanent Mold Castings.

Powered Fork Truck Lifts Own Weight, 1000 lb

Weighing slightly over 1000 lb, a powered fork truck lifts its own weight. It weighs 1050 lb and lifts 1000 lb, depending on the load center. The materials handler lifts a full load 6 ft 6 in. in 6½ seconds. The model is light enough for use on old floors; its large tires make outdoor use practical, too. It climbs a 20-pct grade with a full 1000-lb load. Passing through narrow and low

doors with ease, the unit is only 31½-in. wide. The mast, when tilted back, clears a 6 ft 8 in. door. A Wisconsin air-cooled, 6.8-hp engine powers the fork truck. Its completely enclosed all-gear transmission is lubricated by one reservoir of oil. (The Prime-Mover Co.).

For more data circle No. 49 on postcard, p. 149



Nondestructive Tests

A portable unit inspects welds for lack of penetration and fusion, slag inclusions, crater cracks, thermal cracks both in weld and parent metal, porosity and gas pockets, and other defects. The nondestructive test unit furnishes both half-wave dc for locating sub-surface defects, and ac for finding cracks open to the surface. (Magnaflux Corp.).

For more data circle No. 50 on postcard, p. 149

Plastic Resists Fire

Plastic resin reinforced with fiberglass materials now provide complete corrosion resistance to a wide range of conditions. A further advantage: sharply improved fire resistance. This new resin will not support combustion. (Haveg Industries, Inc.).

For more data circle No. 51 on postcard, p. 149

Inserts Do Many Jobs

Combining multi-diameter boring operations and even chamfering in the same tool is possible with new



micro-adjustable boring tools. Throw-away inserts requiring no



handles more materials FASTER, CHEAPER, EASIER!

With MacGrab's GIANT BITE your scraphandling costs go down...speed and efficiency go up. Baled materials, small loose of prepared scrap, springy stuff, scrap metals of any kind, clean-up jobs...they're all the same to MacGrab's powerful magnet and keenly pointed tines. Positive closing power is applied to all four tines. MacGrab's simple construction means fewer moving parts to wear out, yet less weight than any unit of similar capacity. Your operator can use either the grapple or the magnet, or both at once... depending on the job. MacGrab is built for 4-yard or larger cranes, works easily in a standard 8-foot truck body.

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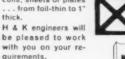
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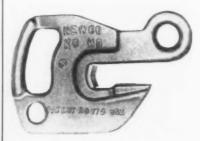
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TITLE		
COMPANY		
STREET		

grinding of any kind are used in each location. The anvil on which each insert locks is micro-adjustable in and out. Each division of the screw-dials represents 0.001 inch on diameter. Once set on the job, the anvils or bars require no adjustment. When inserts are dull, they are simply indexed to a new and unused edge or interchanged. (Wesson Co.). For more data circle No. 52 on postcard, p. 149

Hook Handles Pipe

This pipe hook handles thin wall beveled edge pipe. The hook has a 1-in, throat opening and a wide flange lip to give more bearing surface. A soft brass insert in its



neck prevents damage to beveled edges. This hook is a steel casting with 79,000-psi tensile strength. It weighs 8½-lb, and has a rated safe working load of 8500-lb. (Newco Mfg. Co.).

For more data circle No. 53 on postcard, p. 149

Vinyl Insulates Wire

Extruded semi-rigid vinyl insulated wire is said to eliminate necessity of expensive jacketing or textile overbraiding. The wire affords all the mechanical protection associated with conventional overbraids. It is very flexible, eliminating wrinkling, creasing and fracturing, generally caused in nylon jacketed wires when bent sharply. The material comes in gages of No. 26 to No. 20 with 0.009-in. wall. It has a 300-v rating by UL for use in electrical accounting machines and electronic computers. (William Brand & Co.).

For more data circle No. 54 on postcard, p. 149

Lining Protects Metal

A corrosion resistant lining material protects metal components of chemical process systems. The product is an elastomeric copolymer based on vinylidene chloride. It is a flexible thermoplastic with high resistance to a broad range of acids, alkalis, salt solutions and solvents commonly encountered in storage tanks, processing tanks, medium to large diameter pipes and fittings, fume ducts and hoods. (The Dow Chemical Co.).

For more data circle No. 55 on postcard, p. 149

Alloy Won't Separate

Use of a unique nickel-chromeboron high temperature brazing alloy solves the problem of brazed joint separation. The brazing alloy possesses excellent joining characteristics, resists separation during processing despite 1300°F process temperatures. (Wall Colmonoy Corp.).

For more data circle No. 56 on postcard, p. 149

Coolant Lubricates

A new synthetic coolant is recommended for use in exacting machining and grinding operations. The material, used with a water vehicle, produces a transparent solution. This has excellent lubricity, good cooling, and produces fine finishes on cast iron, brass, aluminum, and various steels. (Daubert Chemical Co.).

For more data circle No. 57 on postcard, p. 149

Recorder Uses No Ink

This compact operations or events recorder consists of a drum which rotates at speeds from 4 minutes to 24 hours per turn (as ordered). It is used to graphically record when a machine or device is operating or when an operator is producing. It uses no ink. A stylus rests against the chart paper with its adherent layer of white opaque wax crystals. The pressure of the



Satisfied customers for KEELER BRASS CO.

Keeler Brass Company, Grand Rapids, Michigan, keeps their customers satisfied by producing a premium quality product at lowest possible cost. Typical examples are their Cross Recess Screws shown here. They are carefully designed so that one driver fits the entire range of sizes. Slots are sharp and clean, threads and points are sharp and uniform. Surfaces are smooth.

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To efficiently produce their Cross Recess Screws, Keeler Brass Company depends on Keystone "XL" Wire. The reasons are many: cross recess punches turn out considerably more pieces per punch than were formerly produced with another wire. Rejects are 5% to 10% lower. Customer acceptance is up.

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Keystone Steel & Wire Company, Peoria 7, Illinois



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Hydrofluoric Acid

Anhydrous

Hydrofluoric Acid Aqueous

Aqueous

Hydrofluosilicic Acid

Lead Fluoborate

Metallic Fluoborates
Potassium Bifluoride

Potassium Chromium

Fluoride

Potassium Fluoborate

Potassium Fluoride

Potassium Titanium

Fluoride

Silico Fluorides

Sodium Fluoborate

Tin Fluoborate

Zinc Fluoborate

Zinc Fluoride

stylus exposes the strongly contrasting color of the paper beneath. The stylus produces a slight spiral tracing on the chart. The lead screw is also subject to an axial motion from the magnet responding to the input



signal to cause the vertical line. By this means, more than 400 linear inches of clear, accurate recording can be had on a waterproof, easily filed chart only 6 by 14 in. (Gorrell & Gorrell)

For more data circle No. 58 on postcard, p. 149

Unit Ups Production

Several new concepts have been introduced in a recently introduced bearing cap transfer machine. It is said to be the first transfer unit capable of processing two complete sets of caps simultaneously. Now producing 640 sets of bearing caps per hour, the setup is almost six times as productive as the machine it replaces. It allows the user to process parts at one-third of the previous machine cost. Equipped with over 300-hp, the 27-station machine automatically loads surface-broached castings, performs 80 operations and automatically positions two matched sets of bearing caps every 30 seconds on the conveyor ready for assembly. The machine drills, reams, taps, broaches, turns, mills, probes and faces. The broaching operation is unique: the broach is not withdrawn from the hole by hand after the cut is made. (National Automatic Tool Co.).

For more data circle No. 59 on postcard, p. 149

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And this is only one of many rigid quality controls that protect you in every purchase of steel from Ryerson stocks. For example, a heat symbol identifies every bar of alloy steel to avoid the problem of variation from heat to heat. Another example: cylinder tubing can be furnished to more accurate inside diameter through Ryerson specs controlling O.D. and I.D. instead of O.D. and wall.

The result: steel of certified quality—assured by exacting Ryerson controls, whether your product calls for carbon, alloy or stainless steels. And these quality controls become *your* quality controls in your finished product.

These are important points to remember when you specify or purchase steel. You get extra value every time you order from your nearby Ryerson plant.

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CLEVELAND * DETROIT * PITTSBURGH * BUFFALO * CHICAGO * MIEWAUKEE * ST. LOUIS * LOS ANGELES * SAN FRANCISCO * SPOKANE * SEATTLE

The Iron Age Summary

Heavy Plate Users Get a Break

Easier demand for sheets and strip means more heavy plate can be rolled on plate mills.

Tinplate price boost spurs orders to beat deadline. Incoming business improves.

Heavy steel plate users are beginning to see a glimmer of hope. It's not much to cheer about—yet. But if the present easiness in some steel products persists, the heavy plate market may be on its way out of the wilderness.

Here's what is happening: The mills are rolling heavy tonnages of light plate on sheet-strip mills to take up the slack caused by the drop in sheet and strip demand. This in turn eases the burden on regular plate mills. Result: There's more room on the plate mills to produce much-needed heavy plate.

This is not likely to solve the heavy plate shortage at any time in the near future. But it might ease some of the pressure. Buyers Calling Shots — Meanwhile, other steel users are making the most of the shift from a seller's to a buyer's market. They're shopping around; buying from the closest mills to save freight charges, and placing orders with the mill that can offer best delivery. This show of independence is going on even among light plate users.

The mills are taking a realistic approach to the changing market situation. Their business is still healthy, and there are signs this week that demand for sheets is about to improve. But for the first time in months they're selling hard. The ones that can are using the tie-in sale with good effect: Offering tonnages of still-tight products to the customer who takes some of the easier-to-get items.

Pressure For Tinplate — Steel order volume has been slightly better in the past week. It looks as though May — or perhaps April — will be the turning point in sheets

and strip. At least that's the way order books at some mills are shaping up. Tinplate mills meanwhile are in for a busy time. Can companies will be pressing for delivery between now and April 30 when higher tinplate prices go into effect.

Hedging against an expected general steel price boost in July will help bolster demand for other steel products in second quarter. But many steel users are still bent on cutting inventories to the bone—even to the danger point. A large automaker is shooting for a 20-day inventory, including steel en route from the mills. Cutting inventory too low got an auto crankshaft supplier into a jam last week when his major supplier was unable to deliver because of a mill breakdown. Another mill came to the rescue.

Export Looks Good—A pickup in auto building in England and the Continent is tightening up supply in Europe. Some export bar orders are already looking for a home in the U. S. market.

Steel Output, Operating Rates

	This	Last	Month	Year	
Production	Week	Week	Ago	Ago	
(Net tons, 000 omitted)	2,382	2,420	2,529	2,449	
Ingot Rates					
(1947-1949=100)	148.2	150.6	156.2	154.5	
Operating Rates					
Chicago	90.0	93.0	95.0	100.5	
Pittsburgh	96.0	98.0*	100.0	103.0	
Philadelphia	103.5	103.0	105.0	104.0	
Valley	91.0	91.0*	97.0	98.0	
West	100.0	100.0	105.0	101.5	
Buffalo	95.0	95.0	105.0	105.0	
Cleveland	88.0	91.0*	98.0	108.0	
Detroit	95.0	103.0	103.0	101.0	
S. Ohio River	82.0	84.0*	90.0	91.0	
South	95.5	95.5	95.0	88.0	
Upper Ohio R.	94.0	101.0*	103.0	100.0	
St. Louis	91.0	95.5	91.0	101.0	
Northeast	66.0	76.0	40.0	89.0	
Aggregate	93.0	94.5	98.0	99.5	

*Revised

Prices At A Glance

ear
go
.174
.09
.83
.40
.00
.80
.25
.50
.00
.50

Tinmill Products Up \$7.70 a Ton

U.S. Steel takes the lead in raising electrolytic, hot dipped, and black plate.

Corporation also advances base prices on merchant wire—annealed and galvanized.

 Tinplate products have been caught in the upward price swirl.

Electrolytic and hot dipped tinplate and canmaking blackplate are going to cost users \$7.70 a ton more starting April 30, according to U. S. Steel Corp.

This is the second base price increase on tinmill products in six months. Last Nov. I they went up \$2 a ton.

U. S. Steel says the advances, amounting to 35¢ per base box, will mean an average increase of 4½ pct on total price—base price plus extras. Size extras also went up \$3 a ton. Other producers are expected to follow U. S. Steel's lead.

Wire Up \$5-\$8—Merchant wire, annealed and galvanized, is another product joining the price boost parade. New prices (see p. 199) have been announced by American Steel and Wire Div., and Columbia-Geneva Div. of U. S. Steel Corp. Merchant quality annealed wire advanced \$5 a ton and galvanized wire went up \$8 a ton. Similar action can be anticipated from other suppliers.

Sheet and Strip—There's a little more optimism about the flat-rolled market this week, but not much.

While April ordering is off, Pittsburgh producers look for an improvement in the May order rate. Hope is based on the fact that May orders are coming in at a faster rate and major customers are indicating they will increase their tonnages. One major auto producer, however, is still cutting inventory of coldrolled sheet.

Same situation exists at Philadelphia. One mill, at least, has April tonnages of sheet still open. Out-of-the area producers are actively looking for flat-rolled business. However, May and June orders are coming in at a better rate than April's.

Sheet and strip demand at **Detroit** is only fair, although in some cases it has been increased slightly.

Mills at Cleveland estimate up to one-third of the March tonnage in sheet will be deferred into April by automotive and appliance buyers.

Chicago warehouses report a continued falloff in cold-rolled sheet demand. However, the number of orders of hot-rolled sheet marked "emergency, rush" is increasing.

West Coast warehouses, with large inventories in sheet, as well as bar, are urging their salesmen to get out and sell.

Plates and Shapes—Heavy plates and structurals are still tight at Pittsburgh. However, a plentiful supply of ingot is increasing production of heavy steel. Furthermore the transfer of light plate rolling to strip mills is enabling plate mills to turn out heavier tonnages. But warehouses there state that second quarter quota of heavier plate and structurals is no greater than current allotments.

The demand for light plate seems to be easing at **Detroit.** One producer who was making as much as 5000 tons of it a month ago on a

strip mill is now down to about 150 tons a week.

Light plate market is soft at Chicago and mills are noting an increasing number of cutbacks in customer ordering. Producers are talking about increased allocations in both light and heavy plate. There's lots of horse trading among fabricators from their own inventories to get the structurals they need.

On the **West Coast** heavy structurals and plate are still scarce. However eastern mills are coming through with some shipments of light gage material, $\frac{3}{2}$ in. thick and in narrow widths up to 72 in.

Bar — The inventory glut has caught up with hot-rolled bar at **Pittsburgh.** While automotive and implement buying was off, the producers turned out heavy tonnages in recent months. Now, with customer stocks high, the mills face a 10-15 pct drop in shipments in April.

Hot-rolled bar market is a little stronger at **Philadelphia**, but coldfinshed bar is one of the easiest items in the market.

One bar user in the **Cleveland** area almost overdid his inventory cutbacks. He cut his inventories so fine he ran out of bar and only an emergency shipment avoided a production halt.

Cold finished bar is available for almost immediate delivery at **Chicago.** The finishers have large stocks on hand and have cut back orders for hot-rolled from the mills. What's more, some mills can offer April delivery on hot-rolled bar.

PURCHASING AGENT'S CHECKLIST

Construction users were the top steel consumers in '56. P. 92

Despite inflationary trends, business may find that competition will have a leveling effect on price rises.

P. 103

Machine tool sales are off to a good start. P. 113

COMPARISON OF PRICES

(Effective March 12, 1957)

Steel prices on this page are the average of various f.o.b. quotations major producing areas: Pittsburgh, Chicago, Gary, Cleveland, oungstown.

Price advances over previous week are printed in Heavy Type:

week are	printed	in neav	y Type,
Mar. 12 1957	Mar. 5	Feb. 12 1957	Mar. 13 1956
4.675¢	4.675c	4.675c	4.325c
5.75	5.75	5.75	5.325
6.30	6.30	6.30	5.85
4.675	4.675	4.675	4.325
6.870	6.870	6.870	6.29
4.87	4.87	4.87	4.52
10.40	10.40	10.40	10.40
50.00	50.00	50.00	44.50
X I			
89.95	\$9.95	\$9.95	\$9.05
8.65	8.65	8.65	7.75
9.20	9.20	9.20	7.85
5.075c	5.075c	5.075c	4.65c
6.85	6.85	6.85	5.90
6.125	6.125	6.125	5.65
5.00	5.00	5.00	4.60
43.25	43.25	43.25	38.25
11.50	11.50	11.50	11.50
7.20¢	7.20c	7.20¢	6.25€
\$5.275	\$5,275	85.075	84.725
6.25	6.25	6.00	5.65
874.00	274.00	274.00	\$68.50
74.00	74.00	74.00	68.50
91.50	91.50	91.50	84.50
107.00	107.00	107.00	96,00
	Mar. 12 1957 4.6756 5.756 6.30 4.675 6.870 4.87 10.40 50.00 89.95 8.65 9.20 5.075c 6.85 6.125 5.00 43.25 11.50 7.20c 85.275 6.25	Mar. 12 Mar. 5 1957	1957 1957 1957 4.675c 4.675c 5.75 6.30 6.30 6.30 4.675 4.675c 5.75 6.870 6.870 6.870 4.877 4.87 10.40 10.40 10.40 50.00 50.00 50.00 \$1 \$9.95 \$9.95 \$9.95 8.65 8.65 8.65 9.20 9.20 9.20 5.075c 5.075c 5.075c 6.85 6.85 6.85 6.125 6.125 6.125 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 5.00 5.00 3.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00

	Mar. 12 1957	Mar. 5 1957	Feb. 12 1957	Mar. 1: 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila	\$68.88	866.88	866.88	\$63.69
Foundry, Valley	65.00	63.00	63.00	59.00
Foundry, Southern Cin'ti		67.17	67.17	62.93
Foundry, Birmingham		59,00	59.00	55.00
Foundry, Chicago		65.00	63.00	59.00
Basic del'd Philadelphia	68.38	66.38	66.38	62.77
Basic Valley furnace	64.50	62.50	62.50	58.50
Malleable, Chicago		65,00	63.00	59.00
Malleable, Valley		63,60	63.00	59,00
Ferromanganese,				
cents per lbt	12.75e	12.75c	12.75¢	9.500
74 to 76 pct Mn base.				

Pig Iron Composite: (per gross to Pig iron		\$64.00	862.90	\$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$50,50	\$50.50	\$53.50	\$49.50
No. 1 steel, Phila. area	53.50	55.50	57.50	49.50
No. 1 steel, Chicago	11.50	45.50	49.00	47.50
No. 1 bundles, Detroit	42,50	42.50	45.50	44.50
Low phos., Youngstown	50.50	50.50	53.50	54.50
No. 1 mach'y cast, Pittsburgh	56.50	56,50	56,50	55.50
No. 1 mach'y cast, Philadel'a	57.50	57.50	57.50	54.50
No. 1 mach'y cast, Chicago	49.50	49.50	50.50	52.50

Steel Scrap Composite: (per gross ton) No. 1 heavy melting scrap, \$\frac{1}{2}.50	\$50.50	\$53.33	\$48.83
Coke, Connellaville: (per net ton at oven) Furnace coke, prompt \$15.38	\$15.38	\$15.38	\$14.25

Foundry coke, prompt, \$17.50-\$19	3 \$17.50-\$19 \$	7.50-\$19	\$16.25
Nonferrous Metals: (cents per pound	to large buy	ers)	
Copper, electrolytic, Conn 32.	00 32.00	34.00	46.00
Copper, Lake, Conn 32.	00 32.00	34.00	43.00
Tin, Straits, New York 98.	75† 99.00	103.00	102.00
Zinc, East St. Louis 13.	50 13.50	13.50	13.50
Lead, St. Louis 15.	80 15.80	15.80	15.80
Aluminum, virgin ingot 27.	10 27.10	27.10	24.40
Nickel, electrolytic 74.	00 74.00	74.00	64.50
Magnesium, ingot 36.	00 36,00	36.00	33.25
Antimony, Laredo, Tex 33.	00 33.00	33,00	33.00
† Tentative. ‡ Average. * Revised.			

Finished Steel Composite

Base price

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

5.1740

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Phila-delphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Phila-delphia and Chicago.

PIG IRON Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

5.650¢

Base price cents per lb f.o.b. mill

←To identify producers, see Key on P. 198→

5.80¢ 4.225

5.670¢

Producing Point	Basic	Fdry.	Mail.	Bess.	Low Phos.
Birdaboro, Pa. B6	66.50	67.00	67.50	66.00	
Birmingham R3	58.50	59.00°			11444
Birmingham W9	58.50	59.00°	63.00		
Birmingham U4	58.50	59.00°	63.00		
Buffalo R3	64.50	65.00	65.50	66.00	
Buffalo H1	64.50	65.00	65.50	66.00	
Buffalo W6	66.50	67.00	67.50	68.00	
Chester P2	66.50	67.00	67.50		
Chicago 14	64.50	65.00	65.00	65.50	
Cleveland A5	64.50	65.00	65.00	65.50	69.50
Cleveland R3	64.50	65.00	65.00	65.50	
Duluth 14	64.50	65.00	65.00	65.50	69.50
Erie 14	64.50	65.00	65.00	65.50	69.50
Everett M6	64.50	65.00	65.50		
Fontana K1	70.50	71.00			
Geneva, Utah C7	62.50	63.00			
Granite City G2	66.40	66.90	67.40		
Hubbard Y/			65.00		
Ironton, Utah C7	64.50	65.00			
Midland C//	64.50				
Minnegua C6	64.50	65.00	65.50	66.00	
Monessen P6	62.50				
Neville Is. P4	64.50	65.00	65.00	65,50	69.50
N. Tonawanda TI		65.00	65,50	66.00	
Sharpsville S3	64.50	65.08	65.00	65.50	
So. Chicago R3	64.50	65.00	65.00	1	
Swedeland A2	66.50	67.00	67.50	68.00	
Toledo /4	64.50	65.00	65.00	65.50	
Troy, N. Y. R3	66,50	67.00	67.50	68.00	72.50
Youngatown Y/			65.00	65.50	

	'	1	'		
DIFFERENTI		4 754	ner ton	for each	0.25
ailicen or portic					
lew phos., 1.75					
manganese or					
0.5 to 0.75 pct					
* Add \$1.00 for	0.31-0.6	9 mct pho	os. † Inte	rmediate	low phos.
* 4.4.4 \$1.00 for	0 31 to	0 50	nhaa		

Silvery Fron: Buffalo, HI, \$78.50; Jackson, JI, 14 (Globe Div.), \$77.25; Niagara Falls (15.01-15.50), \$99.50; Keskuk (14.01-14.50), \$110.00; (15.51-16.00), \$105.00. Add \$1.25 per ten for each 0.50 pct silicon over base (6.01 to 6.50 pct to 10 to 10 to 12.00 pct. Add \$1.00 for each 0.50 pct managames over 1.00 pct. Beasemer silvery pig iren (under 1.0 pct phoa.); \$54.00. Add \$1.00 premium for all grades silvery 6 pct to 14 pct.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	21.25	22.75	22.25	24.25	-	26.00	38.25	31.00	35.50	-	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	-	20.75	-	21.00
Billets, forging	-	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	39.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	\$7.50	67.00	38.75	33.75	35.50	34.50
Sheeta	46.75	47.25	49.25	50.00	-	53.25	78.25	63.00	76.25	46.50	38.75	46,50	39.25
Strip, het-rolled	34.50	37.50	35.75	39.00	-	42.50	66.50	51.50	61.00	-	29.75	-	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	-	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	-	39.25	40.25- 40.50	41.00- 41.25	44.00	43.75	66.75- 67.00	50.50- \$1.00	59.25- 59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A1; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, I4; Philadelphia, D5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A5; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R1; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion entras); W1; New Bedford, Mass. (.25¢ per lb higher), R6; Gary, U1 (.25¢ per lb higher).

Bar: Baltimore, A7; S. Duquesne, Pa., UI; Munhall, Pa., UI; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., I2; McKeesport, Pa., UI, FI; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, UI; Syracuse, N. Y., CII; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5; Ft. Wayne, I4; Philadelphia, D5; Detroit, R5; Gary, UI.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, UI; Munhall, Pa., UI; Midland, Pa., CII; New Castle, Ind., I2; Middletawan-A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., CI5; Philadelphia, D5; Vandergrift, Pa., UI; Gary, UI.

Forgings billets: Midland, Pa., CII; Baltimore, AI; Washington, Pa., J2; McKeesport, FI; Massillon, Canton, O., R3; atervliet, A3; Pittsburgh, Chicago, UI; Syracuse, CII; Detroit, R5; Munhall, Pa., S. Chicago, UI.

Resistance Fails To Halt Skid

Scrap decline continues, but some resistance is beginning to show up.

Export license decision should be reached in about three weeks.

 Continued weakness and further price declines prevail in the scrap market.

The extent to which the market declines now depends on how far prices can be pushed down before they dry up sources of scrap. There are some indications of this in industrial sources, but scrap continues to move out of dealer yards in most markets.

Some inventories of secondary grades are building up. Railroads show hesitation to offer their lists at current prices and one Midwest road withheld its tonnage in recent days.

Nickel scrap prices have broken in the past week due to slowup of orders for stainless steel. Recent prices have been \$490 per ton for 18-8 stainless and current prices are now about \$460-\$450 with some offerings as low as \$410. Most big consumers are out of the market.

Export Decision Coming—On the export side, U. S. Commerce Dept. officials expect to settle on a permanent policy regarding exports of ferrous scrap within the next three weeks. This was disclosed to THE IRON AGE by a Commerce Dept. official.

At present, the government is licensing without restriction shipment of all types except heavy melting grades, which can only move in "hardship cases."

On the basis of lower prices in

most major markets THE IRON AGE Composite Price continued its decline to \$49.50.

Pittsburgh—An uneasy quiet has settled on the Pittsburgh scrap market. Little scrap is moving, but some small orders of less than representative tonnages are rumored at lower prices. One major consumer has not placed any orders for a month. No one knows how far prices can be pushed without drying up the flow of scrap. But mills appear to be in the driver's seat.

Chicago—There is a mild downtrend in the market, with small sales of scrap to district mills. Tonnages based on new orders continue small. There has been some dealer resistance to the sinking price levels, as well as some withholding of scrap by large generators. Effect is to reduce the amount of scrap in dealer yards and the amount available for delivery. Confusing the issue is the withdrawal of about 12 openhearths in the district because of the oxygen strike.

Philadelphia — Very little scrap was changing hands in this market. What little activity took place was below last week's prices. Steelmaking grades were down \$2 to \$3. Blast furnaces grades were off \$1. Orders were hard to get and mills, capitalizing on general market weakness, were nibbling prices down.

New York — Brokers here breathed a sigh of relief when the tug boat strike was settled, permitting resumption of export shipping. This renewed prices at going levels. The trade is busy shipping exports and filling March domestic orders.

Detroit — Blast furnace grades declined \$2 this week in sympathy with lower prices of openhearth scrap. The market appears to have leveled off temporarily, but further declines are expected.

Cleveland — Major foundries came into the market for cut structural and plate at \$53, or \$1.50 under the market, and two-ft foundry steel at \$51 for only activity in a dull week. Dealers are starting to pile some cheaper grades and will start on prime grades if prices get into the low \$40's.

St. Louis—The market continues quiet, and offerings are almost negligible, principally because of the lower prices. A local railroad withdrew its offering, which included 2250 tons of melting steel and other items, because of dissatisfaction with the price situation.

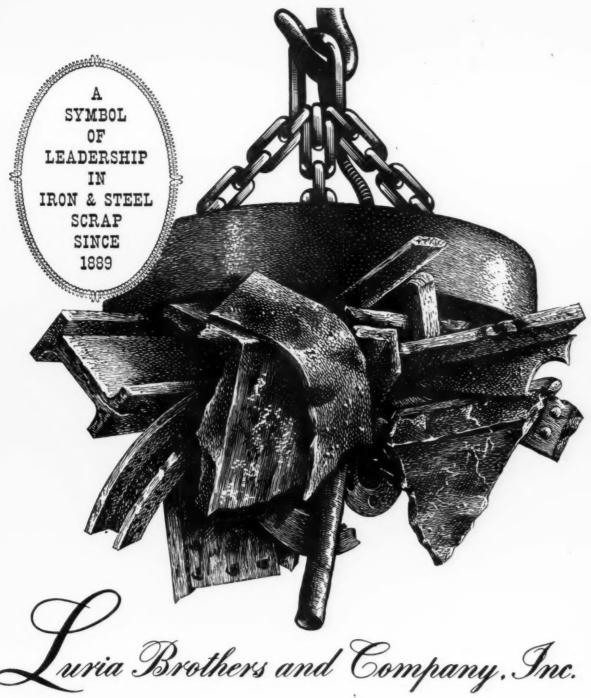
Birmingham—The market continues very quiet except for export. One consumer purchased No. 2 heavy melting, but there have been no sales of No. 1 for some time. Even electric furnace market is dull

Cincinnati—Prices declined another \$1 on appraisal, with all of this month's tonnage to major mills covered easily. No new orders are in prospect until next month. Pittsburgh mills are interested only in No. 2 bundles delivered at about \$40.

Buffalo—No. 1 bundles are off \$1 on the basis of a sale. But this sale represented the lowest tonnage in months. The market continues weak, with little activity. A strike at a local mill contributes to the weakness.

Boston—Most orders are going at current prices. This will probably continue through March 15. After that, an additional letdown is expected. The market is very quiet.

West Coast—Prices for top steelmaking grades on the Coast are near the highest in the country. And they are firm. But there is plenty of scrap to meet current needs. Exporting to Japan is strong.



MAIN OFFICE PHILADELPHIA NATIONAL BANK BLDG.

Philadelphia 7, Penna.

LEBANON, PENNA. DETROIT (ECORSE), READING, PENNA. MICHIGAN MODENA, PENNA. PITTSBURGH, PENNA.

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in Canada MONTREAL, QUEBEC - HAMILTON, ONTARIO

EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. Cuble Address: FORENTRACO

Pittsburgh

No. 1 hvy. melting	\$50.00	to	\$51.00
No. 2 hvy. melting	44.00		45.00
No. 1 dealer bundles	50.00	to	51.00
No. 1 factory bundles	54.00	to	55.00
No. 2 bundles	40.00	to	41.00
No. 1 busheling	50.00	to	51.00
Machine shop turn	36.00	to	37.00
Mixed bor, and ms. turn.	36.00	to	37.00
Shoveling turnings	40.00	to	41.00
Cast iron borings	40.00	to	41.00
Low phos. punch'gs plate	54.00	to	55.00
Heavy turnings	45.00	to	46.00
No. 1 RR. hvy. melting	54.00	to	55.00
Scrap rails, random lgth	67.00	to	68.00
Rails 2 ft and under	70.00	to	71.00
RR. steel wheels	68.00	to	69.00
RR. spring steel	68.00	to	69.00
RR. couplers and knuckles	68.00	to	69.06
No. 1 machinery cast	56.00	to	57.00
Cupola cast	48,00	to	49.00
Heavy breakable cast.	46,00	100	47.00

Chicago

No. I hvy, melting	\$44.00 to	\$15.00
No. 2 hvy. melting	41.00 to	
No. 1 dealer bundles	45,00 to	46.00
No. 1 factory bundles	49.00 to	50.00
No. 2 bundles	37,00 to	38.00
No. 1 busheling	44,00 to	
Machine shop turn,	31.00 to	
Mixed bor, and turn,	32,00 to	34.00
Shoveling turnings	33.00 to	
Cast iron borings	33,00 to	
Low phos. forge crops	58,00 to	
Low phos. punch'gs plate	53,00 to	
Low phos. 3 ft and under	52.00 to	
No. 1 RR, hvy, melting	52.00 to	
Scrap rails, random lgth.	59,00 to	
Rerolling rails	60.00 10	
Italis 2 ft and under	63,00 to	
Locomotive tires cut	56,00 to	
Cut bolsters & side frames	54.00 to	
Angles and splice bars	59.00 to	
RR. steel car axles	74.00 to	
RR. couplers and knuckles	53,00 to	
No. 1 machinery cast	49,00 to	
Cupola cast	43.00 to	
Heavy breakable cast	42.00 to	
Cast iron brake shoe	42.00 to	
Cast iron wheels	51.00 to	
Malleable	60.00 to	
Stove plate	42.00 to	
Steel car wheels	54.00 to	
Division amount and	0.11.00 00	00.00

Philadelphia Area

. minancipina rii va			
No. 1 hvy melting	\$53.00	to	\$54.00
No. 2 hvy. melting	44.00	to	45.00
No. 1 dealer bundles			
No. 2 bundles			
No. 1 busheling	53.00		
Machine shop turn	40.00		
Mixed bor, short turn.	42.00		
Cast iron borings	42.00		
Shoveling turnings	14,00		45.00
Clean cast chem, borings	45.00		46.00
	57.00		
Low phos. 5 ft and under			
Low phos 2 ft and under	58,00		
Low phos. punch'gs	58,00		
Elec. furnace bundles	56,00	to	57.00
Heavy turnings	49,00	10	50.00
RR. steel wheels	66.00	to	67.00
RR. spring steel	66.00	to	67.00
Rails 18 in. and under	74.00	103	75.00
Cupola cast	50.00		51.00
Heavy breakable cast	55,00		56.00
Cast iron car wheels	61.00		
	63.00		
Malleable			
Unstripped motor blocks	41.00		42.00
No. 1 machinery cast	57.00	to	58.00

Cleveland

No. 1 hvy. melting	46,00	03	\$47.00
No. 2 hvy. melting	42.00	to	43.00
No. 1 dealer bundles	46.00	to	47.00
No. 1 factory bundles			49.50
No. 2 bundles	35.00	to	36.00
No. 1 busheling	46.00	to	47.00
Machine shop turn	26.50	to	27.50
Mixed bor, and turn,	31.50	to	32.50
Shoveling turnings	31.50	to	32.50
Cast iron borings	31.50	to	32.50
Cut struct'r'l & plates, 2 ft			
& under	52.50	to.	53.50
Drop forge flashings	46.00	to	47.00
Low phos. punch'gs, plate	47.00	to	48.00
Foundry steel, 2 ft & under	50,00	to	51.00
No. 1 RR. heavy melting .	51.00		52.00
Rails 2 ft and under	69.00	to	70.00
Rails 18 in. and under	70.00	to	71.00
Railroad grate bars	35.00	to	36.00
Steel axle turnings	33.00	to	34.00
Railroad cast	53.00	to	54.00
No. 1 machinery cast	52.00	to	53.00
Stove plate		to	50.00
Malleable	57.00	of	58.00

Iron and Steel Scrap

Going prices of Iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting .				 \$49.00	to	\$50.00
No. 2 hvy. melting .						
No. 1 dealer bundles	3 .			 49.00	to	50.00
No. 2 bundles						
Machine shop turn.						
Shoveling turnings .						
Cast iron borings						
Low phos. plate		٠	۰	 50.00	to	51.00

Buffalo

No. 1 hvy. melting	48.00	to	\$49.00
No. 2 hvy. melting	42.00	to	43.00
No. 1 busheling	48.00	to	49.00
No. 1 dealer bundles	48.00	to	49,00
No. 2 bundles	39.00	to	40.00
Machine shop turn	31.00	to	32.00
Mixed bor. and turn	31.00	to	32.00
Shoveling turnings	34.00	to	35.00
Cast iron borings	32.00	to	33.00
Low phos. plate	54.00	to	55.00
Scrap rails, random lgth.	63.00	to	64.00
Rails 2 ft and under	67.00	to	68.00
RR. steel wheels	56.00	to	57.00
RR, spring steel	56.00	to	57.00
RR, couplers and knuckles	56.00	to	57.00
No. 1 machinery cast	49.00	to	50.00
No. 1 cupola cast			49.00

Detroit

Detroit	
Brokers buying prices per gro	ss ton, on cars:
No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	41.00 to 42.00
Drop forge flashings	41.00 to 42.00
Machine shop turn	26.00 to 27.00
Mixed bor, and turn	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs, plate	42.00 to 43.00
No. 1 cupola cast	46.00 to 47.00
Heavy breakable cast	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	47.00	to	\$48.00
No. 2 hvy. melting	43.00	to	44.06
No. 1 dealer bundles	47.00	to	48.00
No. 2 bundles	37.50		
Machine shop turn	32,00		
Cast iron borings	34.00		
Shoveling turnings	34.00		
No. 1 RR. hvy. melting.	50.50		
Rails, random lengths	55.00		
Rails 18 in. and under	63.00		
	51.00		
Locomotive tires uncut			
Angles and splice bars	55.00		
Std. steel car axles	73.00		
RR. specialties	54.00		
Cupola cast	44.00		
Heavy breakable cast	40.00		
Cast iron brake shoes	49.00	to	50.00
Stove plate	41.00	to	42.00
Cast iron car wheels	46.00	to	47.00
Rerolling rails	61.00	to	62.00
Unstripped motor blocks	40.00	to	41.00

Boston

Brokers buying prices per group	s ton, or	cars:
No. 1 hvy. melting	45.00 to	\$46.00
No. 2 hvy. melting	36.00 to	37.00
No. 1 dealer bundles	45.00 to	46.00
No. 2 bundles	34.00 to	
No. 1 busheling	45.00 to	46.00
Elec. furnace, 3 ft & under	50.50 to	51.50
Machine shop turn	29.00 to	30.00
Mixed bor, and short turn.	31.50 to	32.50
Shoveling turnings	31.50 to	32.50
Clean cast, chem. borings .	33.00 to	34.00
No. 1 machinery cast	47.00 to	48.00
Mixed cupola cast	41.50 to	42.50
Heavy breakable cast	46.00 to	47.00
Stove plate	41.00 to	42.00
Unstripped motor blocks	33.00 to	34.00

New York

Brokers buying prices per gross to	n, on cars:
No. 1 hvy. melting \$47.5	0 to \$48.50
No. 2 hvy. melting 38.5	0 to 39.50
	00 to 38.00
Machine shop turn 30.0	00 to 31.00
Mixed bor, and turn 32.0	00 to 33.00
Shoveling turnings 34.0	00 to 35.00
Clean cast chem. borings 31.0	00 to 32.00
No. 1 machinery cast 48.0	00 to 49.00
Mixed yard cast 44.0	00 to 45.00
Charging box cast 45.0	00 to 46.00
Heavy breakable cast 46.0	00 to 47.00
Unstripped motor blocks 34.6	00 to 35.00

Birmingham

No. 1 hvy, melting			\$43.00
No. 2 hvy. melting	37.00		38.00
No. 1 dealer bundles	42.00	to	43.00
No. 2 bundles	28.00	to	29.00
No. 1 busheling	42.00	to	43.00
Machine shop turn	34.00	to	35.00
Shoveling turnings	36.00	to	37.00
Cast iron borings	27.00		28.00
Electric furnace bundles	48.00	to	
Bar crops and plate	52.00		
Structural and plate, 2 ft.	51.00		
No. 1 RR, hvy, melting	48.00		
Scrap rails, random lgth	56,00		
Rails, 18 in. and under	59,00		
Angles & Splice bars	57.00		
Rerolling rails	62.00		
	51.00		
No. 1 cupola cast.			
Stove plate	50.00		
Charging box cast	40.00		
Cast iron car wheels	38.00		39.00
Unstripped motor blocks	41.00		
Mashed tin cans	15.00	to	16.00
Elec. furnace, 2 ft & under	48.00	to	49.00

Cincinnati

Brokers buying prices per	gross	ton,	on	cars:
No. 1 hvy. melting	. \$4	4.00	to \$	45.00
No. 2 hvy. melting	3	8.00	to	39,00
No. 1 dealer bundles	4	4.00	to	45.00
No. 2 bundles	3	4.00	to	35.00
Machine shop turn		1.50	to	32.50
Mixed bor, and turn	3	0.50	to	31.50
Shoveling turnings	3	4.00	to	35.00
Cast iron borings		0.50	to	31.50
Low phos. 18 in. & under	5	3.00	to	54.00
Rails, random lengths	5	8.00	to	59.00
Rails, 18 in. and under	6	7.00	to	68.00
No. 1 cupola cast	4	6.00	to	47.00
Hvy. breakable cast	4	6.00	to	47.00
Drop broken cast		6.00	to	57.00

San Francisco

No. 1 hvy, melting	. \$55.00
No. 2 hvy. melting	50.00
No. 1 dealer bundles	. 54.00
No. 2 bundles	. 38.00
Machine shop turn	
Cast iron borings	
No. 1 RR. hvy. melting No. 1 cupola cast	
No. 1 cupota cast	. 07.00

Los Angeles

	\$55.00
No. 2 hvy. melting	51.00
No. 1 dealer bundles	54.00
No. 2 bundles	36.00
Machine shop turn	35.00
Shoveling turnings	37.00
Cast iron borings	34.00
Elec. furn. 1 ft. and under	
(foundry)	66.80
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast \$57.00 to	68.00

Seattle

No. 1	hvy. melting				×	×					\$55.00
No. 2	hvy. melting										51.00
No. 2	bundles						\$31	J	0.0	to	34.00
No. 1	cupola cast.			×		×					55.00
Mixed	yard cast.										55.00

Hamilton Ont.

No. 1 hvy. melting	۵.	\$48.00
No. 2 hvy. melting		43.00
No. 1 dealer bundles		48.00
No. 2 bundles		37.00
Mixed steel scrap		40.00
Busheling		 34.00
Bush., new fact., prep'd		46.00
Bush., new fact., unprep'd		42.00
Machine shop turn,		27.00
Short steel turn		 33.00
Mixed bor, and turn		24.00
Rails, rerolling		54.00
Cast seran		E0.00



Brass Mill Outlook Is Confusing

Business is better, say some mills. It's still pretty bad, say others.

But there are more yeas than nays.

Key factors are copper price and slackened business of brass mill customers.

 "Business is lousy," says the sales manager of a brass mill products distributor. But, the sales head of a major brass mill reports a "decided increase in March orders."

What does it mean? The brass mill products market is currently confused. For many, order books still have a lot of blank pages. But for others business is starting to pick up. The bright spot in the melee is the fact that there are more optimists now than at the same time last month.

Inventories Low — Mills agree that most customers are still buying from hand-to-mouth. Several say some consumers are buying less than they are using, working off inventories. Inventories are considered to be down. One mill says his customers' stocks are at their lowest point in 10 years. But the brass mills are divided on why.

Many say their customers are still staying off the market waiting for a lower copper price. Others say the most likely solution is a gradual pick-up in demand if copper producers hold the 32¢ per lb price line. Still others say the price would have to hold steady for at least two months, would not basically affect brass mill orders in the second quarter.

Several mills assert the ideal solution would be another drop in the copper price, with part of the fall immediately recovered. This, they feel, would convince customers the bottom had been reached, and would result in heavier second quarter orders.

"If this happened, they'd pick us clean in a couple of days," says a brass mill sales manager. His reason: Those in the market now are primarily the small customers. If the big orders come in too rapidly it would overtax his firm's ability to make prompt deliveries.

About half of the brass mills consider slackening of their customers' business as the reason for their slow first quarter. This group includes most of the mills which report improved business. They say there are still a lot of blank pages in order books, but report less fluctuation, more steady buying.

The most repeated reason for the expected uptrend is the fact that spring is the traditional big season for at least three of the brass mills' best customers — automotive, home builders, and air conditioning equipment.

Mills say balmy weather will move heavy finished inventory off the shelves in these industries. Depleted stocks of raw materials will have to be replenished.

A few mills still complain of losing business to foreign imports. But they say as the price of copper weakens the situation becomes less serious.

Nickel—Freeport Sulphur Co. is all set to enter the nickel producing business. General Services Administration has agreed to accept up to 271 million lb of nickel, and 23.8 million lb of cobalt from the facilities Freeport will build in Cuba.

Freeport was granted a certificate of necessity for rapid tax amortization about three years ago, conditioned on the success of its pilot operation. The new process Freeport will use has been proved. New plan will cost twice the original estimate. Freeport will consult ODM before proceeding further.

Capacity—Freeport says it will spend about \$100 million for equipment to turn out 50 million lb of nickel and 4.4 million lb of cobalt annually. Ore will be mined and concentrated at Moa Bay, Cuba, and refined at a plant to be built on the gulf coast. Rapid write-off applies to all facilities.

The company says construction schedules depend on financing arrangements still to be made. However, it anticipates start of production about the summer of 1959.

It is not likely GSA will be offered much nickel by Freeport. The company will sell it to nickel-starved U. S. industry. If it does get any metal, GSA will pay today's prices (74¢ for nickel, \$2 for cobalt) despite any future price fluctuations.

Reserve Clause—The government reserves the right to require delivery of 30 pct of the annual output of the

Primary Prices

cents per lb)	Current	price	change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	32.00	34.00	2/18/57
Copper (CS)	31.00	32 00	2/20/57
Copper L	32.00	34.00	2/19/57
Lead, St. L.	15.80	16.30	1 13/56
Lead, N. Y.	16.00	16.50	1/13/56
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	250-275	270-300	12 4 56
Zinc, E. St. L.	13.50	13.00	1/6/56
Zinc, N. Y.	14.00	13.50	1/6/56

ALUMINUM: 99% ingot frt allwd. COP-PER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourno. Canada. ZINC: prime western. TIN: see column at right, other primary prices, pg. 194.

new plant. The contract will expire June 30, 1965.

The Freeport operation is expected to take some of the strain off the tight nickel market. The government's reserve privilege, combined with its claim on Nicaro nickel, will lessen its need for a huge nickel stockpile.

The operation will be run by Cuban American Nickel Co., a subsidiary of Freeport Sulphur Co.

Inco Deliveries Off—The Freeport project may be coming at just the right time. The International Nickel Co. reports deliveries of nickel in 1956 were down from the previous year. The world's chief source of nickel delivered 286.1 million lb of nickel in all forms to consumers last year, and 290.4 million lb the previous year.

The company says the drop was because it had delivered more than was produced in 1955 and badly depleted working stocks.

Outlook for the future is good, mainly due to the gigantic Manitoba project which will boost Inco capacity to 385 million lb. However, it will be 1961 before this nickel will reach markets.

It now appears the combination of Inco's Manitoba project, Freeport's Moa Bay, Cuba and the possibility of Bethlehem Steel entering the market as a producer spells relief for nickel consumers in four to five years.

Magnesium—Primary ingot production in January was 7111 tons, an all-time monthly high, reports the Magnesium Assn. It just about topped the 7085 tons turned out the previous month, but was fully 12 pct more than the 6337 tons output January 1956.

Shipments of wrought products in January, 1065 tons, were off from 1226 tons shipped in December 1956. However, the Association expects this to be reversed, and more tonnage shipped in 1957.

Tin prices for the week: Mar. 6—99.25; Mar. 7—99.75; Mar. 8—99.50; Mar. 11—98.875; Mar. 12—98.75.*

* Estimate.



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Unnoticed by most . . . taken for granted by those who live by its warnings, the searchlight signal of cTc — Centralized Traffic Control — stands guard on railways stretching from coast to coast. In bustling terminals . . . at lonely prairie crossroads, Seymour "PHOSPHOR BRONZE" helps these unfailing sentinels flash the stop and go messages which control our rail-borne commerce. Contact springs, connectors and other parts of their electric nerve system are formed from this corrosion-resistant, even-tempered, long-lived and reliable metal.

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THE SEYMOUR MFG. CO.

2 FRANKLIN STREET, SEYMOUR, CONNECTICUT

*Registered Trade Mark of the General Railway Signal Company

MILL PRODUCTS

(firmte per lb, unless otherwise noted)

ALUMINUM

(Base 20,000 lb, f.o.b. ship. pt., frt. allowed) Flat Sheet (Mill Finish) and Plate ("F" temper except 6061-0)

Alloy	.032	.081	.136- .249	.25 0 - 3.
1800, 1100,	44.3	42.1	40.9	40.2
3003	51.8	46.8	45.1	42.9
5052	48.9	44.6	42.8	42.6

Extruded Solid Shapes

	_	1	7	M	31	0	P					6063 T-5	6062 T-6
6- 8.												42.7-44.4	57 .6-61 .1
12-14.		×										43.4-44.8	58.4-62.7
24-26.												46.4-46.9	68.7-73.1
86-38.								ĺ.				54.8-55.4	91.5-94.5

Screw Machine Stock-2011-T-3

Bise*	34	36-36	%-1	11/4-11/4
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated (Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	\$1.352	\$1.803	\$2.254	\$2.704
	1.686	2.252	2.815	3.378

MAGNESIUM

(P.o.b. shipping Pt., carload frt. allowed) Sheet and Plate

Type Gage	. 250- 3 . 00	. 250- 2.00	.188	.081	.032
AE31B Stand, Grade	*****	67.9	69.0	77.9	103.1
AES1B Spec.		92.3	95.7	108.7	171.3
Trend Plate		70.6	71.7		
Tooling Plate	78.0				

Extruded Shapes

factor-+	9-4	13-14	24-26	36-38
Comm. Grade (AZ31C)	89.6	70.7	75.6	89.2
Spec. Grade (AESIB)	84.4	85.7	90.6	104.2

Alloy Inget

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Incomel
Sheet, CR	. 126	106	128
Strip, CR		108	138
Rod, bar, H		89	109
Angles, HR		N.94	1419
Plates, HR	1.20	105	121
Seamless tu	be. 157	129	200
Shot blocks		57	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13		51.36	54.32
Bram, 70/30	47.52	48.06	47.46	50.43
Brass, Low	50.20	50.74	50.14	53.01
Brass, R L	51.14	51.68	51.08	53.95
Brass, Naval	51.69		46.00	55.10
Munts Metal	49.79		45.60	
Comm. Bz.	52.63	53.17	52.57	55.19
Mang. Bz.	55.43	144447	49.53	
Phos. Bz. 5%	73.17		73.67	

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$11.00\$12.10: alloy, \$14.75; Plate, HR, commercially
pure, \$9.25-\$9.76; alloy, \$11.25. Write, rolled
and/or drawn, commercially pure, \$8.50-\$9.00;
alloy, \$11.00; Bar, HR or forged, commercially
pure, \$7.10-\$7.35; alloy, \$7.10-\$7.80; billeta, HR,
commercially pure, \$6.85-\$7.10; alloy, \$6.85\$7.05.

PRIMARY METAL

(Cente per 10, uniona bineribine notes)
Antimony, American, Laredo, Tex 38.56 Beryllium aluminum 5% Be, Dollar
per lb contained Be\$74.79
Beryllium copper, per lb conta'd Be.\$43.00
Beryllium 97% lump or beads.
f.o.b. Cleveland, Reading \$71.50
Bismuth, ton lots 2.2
Cadmium, del'd\$ 1.70
Calcium, 99.9%, small lots 4.5
Chromium, 99.8% metallic basis\$ 1.3
Cobalt, 97-99% (per lb) \$2.00 to \$2.0
Germanium, per gm, f.o.b. Miami,
Okla., refined\$48.50-\$53.50
Gold, U. S. Treas., per troy oz\$35.0
Indiam 90 90 dellars per troy or
Indium, 99.9% dollars per troy oz\$ 2.2
Iridium, dollars per troy oz\$90 to \$10
Lithium, 98%
Magnesium, sticks, 100 to 500 lb 59.0
Mercury, dollars per 76-lb flask,
f.o.b. New York\$255 to \$25
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel 71.2
Palladium, dollars per troy oz \$23 to \$2
Platinum, dollars per troy oz \$92 to \$9
Rhodium\$120.00 to \$126.0
Silver ingots (¢ per troy os.) 91.37
Thorium, per kg
Uranium, normal per kg\$40.0
Vanadium 3 3.4
Zirconium sponge\$10.0

REMELTED METALS

Brass Ingot

	((Cents	pe	er	21	6	d	el	1	12	eı	re	96	l,		CI	3	ri	6	16	10	ls)
85	-5-5	ingo	3																				
	No.	115														۰							31.50
	No.	120																					30.00
	No.	123																					28.50
80	-10-	10 in	go	t.																			
	No.	305									*					÷			×				35.50
	No.	315																					33.50
88	-10-	2 ing	ot																				
	No.	210													À	·		·					43.25
	No.	215							i				,								×	×	40.00
	No.	245										×								×			35.50
Y	ellow	inge																					
	No.	405							÷				4				,	4			ź	e	25.25
M	ange	inese		101																			
	No.	421																		0			28.50

Aluminum Inget

(Cents per lb del'd 30,000 lb and over) 95-5 aluminum-silicon alloys

0.30	copper	max.		24.75-25.5	Ð
0.60	copper	max.		.24.50-25.2	
Piston				22.25-23.5	6)
No. 12				22.25-23.5	6)
108 al				22,25-23,5	0
195 al	loy			24.25-25.7	
13 allo				24.50-25.2	
AVS-C				00 05 00 5	41

Steel deoxidizing aluminum, notch bar granulated er shot

Grade	1-95-97195		22.75-23.75
	2-92-954		21.75-22.00
Grade	390-920	 	20,75-21,50
Grade	4-85-90%		20.00-20.50

SCRAP METALS

(Cents per pound, add 1s per lb for shipments of 20,000 lb and over) Heavy Turnings

. ~					ters Scr	ар
Yellow	brass	rod	en	ds	21%	
Mang.					20 1/2	19 %
Comm.					25 %	25 1/6
Red bra					25	24 1/4
Yellow					21 %	20 1/6
Copper				0 0	28	2734

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26 1/2
No. 2 copper wire	25
Light copper	2234
*Refinery brass	23 1/2
Copper bearing material	23
*Dry copper content.	
Innat Makers Seven	

No. 2 copper wire	25
Light copper	223
No. 1 composition	231,
	23
	171/4
Brass Pipe	193
Radiators 171/2-	-18
Aluminum	
Mixed old cast	-15
Mined non-line 17.1/	201
Mixed new clips 15 1/2-	-10 %
Mixed turnings dry 14	-15

Dealer's Scrap
(Dealers' buying price f.o.b. New York
in cents per pound)

Copper and Brass Copper and Irass No 1 copper wire No 2 copper wire Light copper Auto radiators (unsweated) No 1 composition No 1 composition Cocks and faucets Clean heavy yellow brass Eress incess 231/2-

Brass pipe
New soft brass clippings
No. 1 brass rod turnings Alum pistons and struts
Aluminum crankcases
Aluminum crankcases
1100 (2S) aluminum clippings
Old sheet and utensis
Borings and turnings
Industrial castings
2024 (24S) clippings 10 13 4 — 14 10 — 10 4

10 — 61/4— 10 — 11 1/4— Zinc

Nickel and Monel Nickel and Monel
Pure nickel clippings
Clean nickel turnings
Nickel anodes
Nickel rod ends
New Monel clippings
Clean Monel turnings
Old sheet Monel
Nickel silver clippings, mixed
Nickel silver clippings, mixed \$1.65-\$1.75 \$1.65-\$1.75 \$1.65-\$1.75

Lead Soft scrap lead 12 -12 Battery plates (dry) 6½ 6 Batteries, acid free 3¾ 4 Miscellaneous

Block tin 75 —76
No. 1 pewter 59 60
Auto babbitt 39 -40
Mixed common babbitt 12 -124
Solder joints 171/2-18
Siphon tops 42
Small foundry type 1414-1414
Monotype 14 -14 14
Lino, and stereotype 13 -13 %
Electrotype
Hand picked type shells 94-10
Lino, and stereo, dross 4%- 5
Electro. dross 4 - 44

	IRON AGE		Hanes ide	ntuy produce	rs fisted in	key at end of t	able, Dasc	prices, T.o.b.	mill, in cents pe	r ID., uniess o	therwise no	ted. Lauras	appiy.	
	STEEL	BILLE	TS, BLO SLABS	OMS,	PIL- ING		SHAPES UCTURA	ALS			STR	IP		
	(Effective arch 12, 1957)	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
	Bethlehem, Pa.			\$107.00 B3		5.05 B3	7.40 B3	5.05 B3						
	Buffalo, N. Y.	\$74.00 B3, R3	\$91.50 B3, R3	\$107.00 B3, R3	5.90 B3	5.05 B3	7.40 B3	5.05 B3	4.675 B3, R3	6.85 R7	6.95 B3			
	Claymont, Del.		- 82	K)		-			N.					
	Harrison, N. J.													14.55 C/
	Conshohocken, Pa.		\$96.50 A2	\$114.00 .42					4.725 A2	6.90 .42	6.95 A2			
	New Bedford, Mass.									7.30 R6				
ST	Johnstown, Pa.	\$74.00 B3	\$91.50 B3	\$107.00 B3		5.05 B3	7.40 B3							
EAST	Boston, Mass.									7.40 T8				14.90 78
	New Haven, Conn.									7.30 DI				
	Baltimore, Md.									6.85 T8				
	Phoenixville, Pa.					5.85 P2		5.85 P2						
	Sparrows Pt., Md.								4.675 B3		6.95 B3			
	Bridgeport, Wallingford, Conn.	\$79.00 N8	\$96.50 N8	\$107.00 N8						7.30 W1 6.95 N8				
	Pawtucket, R. I. Worcester, Mass.									7.48 A5,N7				14.90 NZ
-	Alton, III.								4.875 <i>L1</i>					
	Ashland, Ky.					-			4.675 A7		-	-		
	Canton-Massillon, Dover, Ohio		\$94.00 R3	\$107.00 R3, T5						6.85 G4		10.10 G4		14.55 G4
	Chicago, III. Franklin Park, III.	\$74.00 UI, R3	\$91.50 U1, R3,W8	\$107.00 UI, R3,W8	5.90 U/	5.00 U1,W8 5.50 P13	7.35 <i>U1.Y1</i> 6.00 <i>W8</i>	5.00 UI	4.675 N4 4.675 A1	6.95 4/,78			7.75 W8. S9	14.55 A S9, T8
	Cleveland, Ohio									6.85 A5, J3			7.75]3	
	Detroit, Mich.			\$107.00 R5					4.775 G3, M2	6.95 M2,G3, D2,P11	7.05 G3	10.10 G3, D2	7.75 G3	
	Anderson, Ind.									6.85 G4		10.10 G4		
	Duluth, Minn.													
MIDDLE WEST	Gary, Ind. Harbor, Indiana	\$74.00 UI	\$91.50 UI	\$107.00 U1, Y1	5.90 /3	5.00 U1	7.35 U1,13	5.25 /3	4.675 U1, 13, Y1	6.85 Y1	6.95 UI, 13, YI	10.20 Y/	7.75 UI. YI	
DDE	Sterling, III.	\$74.00 N4							4.775 N4					
Ē	Indianapolis, Ind.									7 00 C5				
	Newport, Ky.												7.75 A9	
	Middletown, Ohio											1		
	Niles, Warren, Ohio Sharon, Pa.		\$91.50 S1, C10	\$107.00 S1, C10					4.675 S1, R3	6.85 T4	6.95 S1, R3	10.00 S1, R3	7.75 51	14.55 S
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$74.00 U/	\$91.50 UI, CII	\$107.00 UI, CII	5.90 UI	5.00 U1, J3	7.35 UI, J3	5.00 U1	4.675 P6	5.750 P6 6.85 J3,B4, S7			7.75 59	14.55 S
	Portsmouth, Ohio												-	-
	Weirton, Wheeling, Follansbee, W. Va.					5.00 W3			4.675 W3	6.85 W3,F3	6.95 W3	9.65 W3		
	Youngstown, Ohio	\$74.00 R3	\$91.50 Y1, C10	\$107.00 Y/			7.35 YI		4.675 UI, YI	6.85 Y1,C5	6.95 UI, YI	10.20 Y/	7.75 UI. YI	
	Fontana, Cal.	\$83.50 K1	\$101.00 K/	\$128.00 K/		5.75 K1	8.10 K/	5.90 K/	5.525 K1	8.70 K/				
	Geneva, Utah		\$91.50 C7			5.00 C7	7.35 C7							
	Kansas City, Mo.					5.10 S2	7.45 S2		4.925 S2		7.20 S2			
le-	Los Angeles, Torrance, Cal.		\$101.00 B2	\$127.00 B2		5.70 C7, B2	8.05 B2		5.425 B2, C7	8.90 C/			8.95 B2	
WEST	Minnequa, Colo.	-			-	5.30 C6			5.775 C6					
18	Portland, Ore.					5.75 02								
	San Francisco, Niles, Pittsburg, Cal.		\$181.00 B2			5.65 B2	8.00 B2		5.425 C7,B2					
	Seattle, Wash.		\$105.00 B2			5.75 B2	8.10 B2		5.675 B2					
_	Atlanta, Ga.		-						4.875 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$74.60 T2	\$91.50 T2			5.00 T2.R3 5.25 C/6	7.35 72		4.675 T2.R3 4.975 C10 4.925 C16		6.95 T2			
80	Houston, Lone Star, Texas	\$80.00 L3	\$96.50 S2	\$112.00 52		5.10 S2	7.45 S2		4.925 S2		7.20 52			

P Ma	STEEL PRICES (Effective arch 12, 1957) Bethlehem, Pa. Butlalo, N. Y. Claymont, Del. Coatesville, Pa. Conshohocken, Pa. Harrisburg, Pa. Harrisburg, Pa. Harrisburg, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md. Worcester, Mass.	Hot rolled 18 ga. & hvyr. 4.675 B3 4.725 A2	Cold-rolled 5.75 B3 5.80 A2	Galvanized	Enameling	SHEETS Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.	WIRE ROD	Cokes* 1.25-lb, base box	Electro* 0.25-lb. base box	BLACK PLATE Holloware Enameling 29 ga.
EAST	Bethlehem, Pa. Butlalo, N. Y. Claymont, Del. Coateaville, Pa. Conshohocken, Pa. Harrisburg, Pa. Harrisburg, Pa. Hartford, Como. Johnstown, Pa. Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	18 ga. & hvyr. 4.675 B3 4.725 A2	5.75 <i>B</i> 3	Galvanized		Long Terne	Low Alloy H.R.	Low Alloy C.R.	Low Alloy	rolled	5.80 WA	1.25-lb. base box	0.25-lb. base box	Enameling
EAST	Buffalo, N. Y. Claymont, Del. Conteaville, Pa. Conshohocken, Pa. Harrisburg, Pa. Hartford, Conn. Johnstown, Pa. Fairleas, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 A2	5.80 A2					8.525 <i>B</i> 3			5.80 W/6	4.5.		
EAST	Claymont, Del. Coateaville, Pa. Conshohocken, Pa. Harrisburg, Pa. Hartford, Conn. Johnstown, Pa. Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 A2	5.80 A2					8.525 B3			5.80 W6	46		
EAST	Conshohocken, Pa. Harrisburg, Pa. Harrisburg, Pa. Hartford, Conn. Johnstown, Pa. Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.											1.25-lb. coke	e base box naking quality	
EAST	Harrisburg, Pa. Hartford, Conn. Johnstown, Pa. Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.											blackplate 5 deduct \$2.20	9 from 1.25-lb.	-
EAST	Hartford, Conn. Johnstown, Pa. Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 (//	5.80 U/				6.95 .42					* COKES:	1.50-lb.	
EAS	Johnatown, Pa. Fairlesa, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 U1	5.80 U/									ELECTRO 2Sc: 0.75-lb	: 0.50-lb. add	
1	Fairless, Pa. New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 UI	5.80 U/									1.00-lb. add ential 1.00 l	\$1.00. Differ-	
1	New Haven, Conn. Phoenixville, Pa. Sparrows Pt., Md.	4.725 UI	5.80 U/								5.80 B3	add 65¢.	1	
2	Phoenixville, Pa. Sparrows Pt., Md.						6.95 UI	8.575 UI				\$9.80 U1	\$8.50 UI	
1	Sparrows Pt., Md.													
1														
	Worcester, Mass.	4.675 B3	5.75 B3	6.30 B3			6.90 B3	8.575 B3	9.275 B3		5.90 B3	\$9.80 B3	\$8.50 B3	
											6.10 A5			
	Trenton, N. J.													
1	Alton, III.										6.00 L1			
1	Ashland, Ky.	4.675 A7		6.30 47	6.325 47									
	Canton-Massillon, Dover, Ohio			6.30 Ri,RI										
-	Chicago, Joliet, Ill.	4.675 W8,					6.90 U/			5.80 K2	5.80.45,R3, N4,W8,K2			
1	Sterling, III.										5.90 N4, K2		-	
	Cleveland, Ohio	4.675 J3, R3	5.75 J3, R3		6.325 R3		6.90 R3	8.525 R3, J3			5.80 A5			
1	Detroit, Mich.	4.775 G3, M2	5.85 G3 5.75 M2				7.00 G2	8.625 G3						
1	Newport, Ky.	4.675 .49	5.75 49					-						
WEST	Gary, Ind. Harbor, Indiana	4.675 U1. 13. Y1	5.75 UI. 13, YI	6.30 UI, I3	6.325 U1. 13, Y1	6.70 UI	6.90 U1. Y1,I3	8.525 U1, Y1			5.80 Y/	\$9.70 UI,	\$8.40 I3, UI,YI	7.15 UI. YI
DILE	Granite City, III.	4.875 G2	5.95 G2	6.50 G2	6.525 G2								\$8.50 G2	7.25 G2
0	Kokomo, Ind.			6.40 C9							5.90 C9		-	
-	Mansfield, Ohio		5.75 E2			6.70 E2								
8	Middletown, Ohio		5.75 47	6.30 .47	6.325 A7	6.70 47								
2	Niles, Warren, Ohio Sharon, Pa.	4.675 St, R3,N3	5.75 R3	6.30 Ri	6.325 N3	6.70 N3	6.90 SI, R3	8.525 SI, R3					\$8.40 R3	
19	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 U1. J3.P6	5.75 U1. 13,P6	6.30 UI. J3	6.325 UI		6.90 U/I. J3,R3	8.525 U1. J3	9.275 UI		5.80 A5. P6,J3	\$9.70 J3, UI	\$8.40 UI. J3	7.15 UI. J3
F	Portsmouth, Ohio	4.675 P7	5.75 P7								5.80 P7			
-	Weirton, Wheeling,	4.675 W3,	5.75 W3.	6.30 W3,		6.70 W3,	6.90 W3	8,525 W3				\$9.70 W5, W3	\$8.40 W5, W3	7.15 W5
	Follansbee, W. Va. Youngstown, Ohio	4.675 UI,	W5,F3 5,75 Y1	W5	6.325 Y1	W5	6.90 Y/	8.525 Y1			5.80 Y1	W3	W.S	7.40 W3 7.15 Y1
	Fontana, Cal.	5.525 K1	7.00 K1				7.75 K1	9.775 K1				\$10.45 K1	\$9.15 K/	
	Geneva, Utah	4.775 C7										24.50.00		
	Kansas City, Mo.										6.05 52			
WEST	Los Angeles, Torrance, Cal.										6.60 B2			
*	Minnequa, Colo.										6.05 C6			
	San Francisco, Nilea, Pittsburg, Cal.	5.375 C7	6.70 C7	7.05 C7							6.60 C7	\$10.45 C7	\$9.15 C7	
	Seattle, Wash.													
E F	Atlanta, Ga. Fairfield, Ala. Alabama City, Ala.	4.675 T2, R3	5.75 T2	6.30 T2. R3							5.80 T2,R3	\$9.80 T2	\$8.50 T2	

	IRON AGE		Italics identify	Housee's listed	in key at end o	n tacie. Dase p	n ices, 1.0.0. mil	i, in cents per l	o., unicss offi	a wise noted.	appris.	
	STEEL			BA	RS				PLA	TES		WIRE
M	(Effective larch 12, 1957)	Carbon† Steel	Reinforc-	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
	Bethlehem, Pa.				6.125 B3	8.325 B3	7.40 B3					
	Buffalo, N. Y.	5.075 B3,R3	5.075 B3,R3	6.90 B5	6.125 B3,R3	8.325 B5,B3	7.40 B3	4.85 B3				7.20 W6
	Claymont, Del.							5.70 C4		6.85 C4	7.55 C4	
	Coatesville, Pa.							5.25 L4		6.85 <i>L.</i> 4	7.55 L4	
	Conshohocken, Pa.							4.95 A2	5.925 A2	6.85 A2	7.25 A2	
	Harrisburg, Pa.							5.80 P2	6.275 P2			
	Hartford, Conn.			7.35 R3		8.625 R3	7.40 B3	. of D1		5 05 D1	2.05 02	7 90 D2
jus.	Johnstown, Pa.	5.075 B3	5.075 B3		6.125 B3			4.85 B3		6.85 B3	7.25 B3	7.20 B3
EAST	Fairless, Pa.	5.225 U1	5.225 UI		6.275 UI							
	Newark, N. J.			7.30 W/O		8.50 W10						
	Camden, N. J.	e no NO	5 20 N/G	7.30 P10	6 80 NO	8.50 P10	7 50 N/0					
	Bridgeport, Conn. Putnam, Conn.	5.30 N8	5.30 N8	7.20 N8 7.40 W10	6.20 N8	8.475 N8	7.50 N8					
	Sparrows Pt., Md.		5.075 B3					4.85 B3		6.85 B3	6.85 B3	7.30 B3
	Palmer, Worcester, Readville, Mass.	5.225 M7	5.225 M7	7.40 B5,C14		8.625 A5						7.50 A5, H
	Milton, Pa.					8.625 B5						9.025 T8
	Spring City, Pa.			7.30 K4		8.50 K4						
	Alton, Ill.	5.275 L/										7.40 L.I
	Ashland, Newport, Ky.							4.85 A7, A9		6.85 A9		
	Canton, Massillon, Ohio			6.85 R3,R2	6.125 R3,T5	8.325 R3,R2, T5	5 055 H/0	* 05 174 27	reer tv	6 05 511 1510	2 25 511	7.20 A5, A
	Chicago, Joliet, III.	5.075 U1,R3, W8,N4 5.575 P13	5.075 U1,R3, N4 5.575 P13	6.85 A5,B5, W10,L2 W8,N9	6.125 UI, R3, W8	8.325 A5,B5, W8,L2,N9, W10	5.875 W8 7.425 UI	4.85 U1.13, W8,A1	5.925 UI	6.85 U1,W8	7.25 UI	R3,N4,W
	Cleveland, Ohio	5.075 R3	5.075 R3	6.85 A5,C13		8.325 A5,C13	7.425 R3	4.95 J3,R3	5.925 J3		7.25 J3,R3	7.20 A5, C/3
	Detroit, Mich.	5.175 G3	5.425 G3	7.05 <i>B5.P8</i> 7.10 <i>P3</i> 6.85 <i>R5</i>	6.225 G3 6.125 R5	8.525 <i>B</i> 5, <i>P</i> 3, <i>P</i> 8 8.325 <i>R</i> 5	7.525 G3	4.95 G3		6.90 G3		
-	Duluth, Minn.											7.20 A5
E WEST	Gary, Ind. Harbor, Crawfordsville	5.075 U1,13, Y1	5.075 U1.13, Y1	6.85 R3,M5	6.125 U1.13, Y1	8.325 R3,M4	7.425 U1,13, Y1	4.85 U1.13, Y1	5.925 /3	6.85 UI, YI	7.25 UI, YI	7.30 M4
MIDDLE	Granite City, Ill.							5.05 G2		-	-	7.30 C9
Σ	Kokomo, Ind.	FAME NO	E 175 3/4							-	-	7.30 K2
	Sterling, III.	5.175 N#	5,175 N4	6.85 C10	6.125 C10,S1	8.325 C/O	7.425 S1	4.85 S1.R3		6.85 SI	7.25 SI,R3	1.00 100
	Niles, Warren, Ohio Sharon, Pa.											7.00 45
	Pittsburgh, Pa. Midland, Pa.	5.075 UI, CII,J3	5.075 U1,J3	6.85 A5,C8, J3,R3,S9 B4,W10,C11	6.125 UI, CII,J3	8.325 A5,R3, S9,C8,W10, C11	7.425 U1, J3	4.85 U1,J3	5.925 UI	6.85 U1, J3	7.25 U1,J3	7.20 A5., P6
	Portsmouth, Ohio									-		7.20 P7
	Weirton, Wheeling, Follansbee, W. Va.							4.85 W5				
	Youngstown, Ohio	5.075 UI, YI,R3	5.075 UI, YI,R3	6.85 UI, YI, F2	6.125 UI, YI	8.325 Y1,F2	7.425 UI, YI,	4.85 UI, YI, R3		6.85 YI	7.25 YI 7.25 UI	7.20 Y/
	Emeryville, Cal.	5.825 J5	5.825 J5									
	Fontana, Cal.	5.775 K1	5.775 K1		7.175 K/		8.125 K1	5.60 K/		7.60 K1	8.00 K/	
	Geneva, Utah	5.175 C7				1		4.85 C7			7.25 C7	
	Kansas City, Mo.	5.325 S2	5.325 52		6.375 S2		7.675 S2					7.45 S2
ST	Los Angeles, Terrance, Cal.	5.775 C7.B2	5.775 C7,B2	8.30 R3,P14	7.175 <i>B2</i>	10.20 P/4	8.125 <i>B2</i>					8.15 B2
WEST	Minnequa, Colo.	5.525 C6	5.525 C6					5.70 C6				7.45 C6
	Portland, Ore.	5.825 02	5.825 02									
	San Francisco, Niles, Pittsburg, Cal.	5.775 C7 5.825 B2 6.025 P9	5.775 C7 5.825 B2 6.025 P9				8.175 <i>B2</i>					8.15 C7,C
	Seattle, Wash.	5.825 B2 N6	5.825 <i>B2</i>				8.175 <i>B2</i>	5.75 B2		7.75 B2	8.15 <i>B2</i>	
	Atlanta, Ga.	5.575 A8										7.40 48
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	5.075 T2,R3 5.325 C/6	5.075 T2.R3 5.325 C16	7.45 C/6			7.425 <i>T2</i>	4.85 T2,R3			7.25 T2	7.20 T2, F
an.	Houston, Ft. Worth,	5.325 S2	5.325 S2		6.375 S2		7.675 S2	4.95 S2 5.20 L3		6.95 52	7.35 52	7.45 S2

[†] Merchant Quality-Specialty Quality .35¢ higher,

Key to Steel Producers

With Principal Offices

- Al Acme Steel Co., Chicago
- 42 Alan Wood Steel Co., Conshohocken, Pa.
- A3 Allegheny Ludlum Steel Corp., Pittsburgh
- American Cladmetals Co., Carnegie, Pa. 15
- American Steel & Wire Div., Cleveland
- 46 Angel Nail & Chaplet Co., Cleveland.
- Armco Steel Corp., Middletown, Ohio 148
- Atlantic Steel Co., Atlanta, Ga. 19 Acme-Newport Steel Co., Newport, Ky.
- BI Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- BZ Bethlehem Pacific Coast Steel Corp., San Francisco
- B3 Bethlehem Steel Co., Bethlehem, Pa.
- 214 Blair Strip Steel Co., New Castle, Pa
- Bliss & Laughlin, Inc., Harvey, Ill.
- **BIK** Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
- Calstrip Steel Corp., Los Angeles
- CZ Carpenter Steel Co., Reading, Pa.
- C3 Central Iron & Steel Co., Harrisburg, Pa.
- C4 Claymont Products Dept., Claymont, Del.
- Cold Metals Products Co., Youngstown, O.
- Colorado Fuel & Iron Corp., Denver C6
- C7 Columbia Geneva Steel Div., San Francisco Columbia Steel & Shafting Co., Pittsburgh
- C9
- Continental Steel Corp., Kokomo, Ind. C10 Copperweld Steel Co., Pittsburgh, Pa.
- CII Crucible Steel Co. of America, Pittsburgh
- C12 Cumberland Steel Co., Cumberland, Md.
- C13 Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shafting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C17 Chester Blast Furnace, Inc., Chester, Pa.
- D1 Detroit Steel Corp., Detroit
- D2 Dearborn Div., Sharon Steel Corp. D3 Driver Harris Co., Harrison, N. J.
- D4 Dickson Weatherproof Nail Co., Evanston, Ill.
- Eastern Stainless Steel Corp., Baltimore
- E2 Empire Steel Co., Mansfield, O.
- F1 Firth Sterling, Inc., McKeesport, Pa.
- F2 Fitzsimons Steel Corp., Youngstown

- F3 Follansbee Steel Corp., Follansbee, W. Va.
- G2 Granite City Steel Co., Granite City, Ill.
- Great Lakes Steel Corp., Detroit
- G4 Greer Steel Co., Dover, O.
- HI Hanna Furnace Corp., Detroit
- 12 Ingersoll Steel Div., Chicago Inland Steel Co., Chicago
- 14 Interlake Iron Corp., Cleveland
- JI Jackson Iron & Steel Co., Jackson, O.
- 12 Jessop Steel Corp., Washington, Pa.
- 13 Jones & Laughlin Steel Corp., Pittsburgh
- Joslyn Mfg. & Supply Co., Chicago
- 15 Judson Steel Corp., Emeryville, Calif. KI Kaiser Steel Corp., Fontana, Cal.
- Keystone Steel & Wire Co., Peoria
- K3 Koppers Co., Granite City, Ill.
- K4 Keystone Drawn Steel Co., Spring City, Pa.
- LI Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.
- MI Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- Mid States Steel & Wire Co., Crawfordsville, Ind.
- MS Monarch Steel Div., Hammond, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- Milton Steel Products Div., Milton, Pa.
- NI National Supply Co., Pittsburgh
- National Tube Div., Pittsburgh N2
- Niles Rolling Mill Div., Niles, O. N3
- N4 Northwestern Steel & Wire Co., Sterling, Ill.
- Northwest Steel Rolling Mills, Seattle N6 Newman Crosby Steel Co., Pawtucket, R. I. N7
- N8
- Northeastern Steel Corp., Bridgeport, Conn. N9 Nelson Steel & Wire Co.
- 01 Oliver Iron & Steel Co., Pittsburgh
- 02 Oregon Steel Mills, Portland
- PI
- Page Steel & Wire Div., Monessen, Pa. Phoenix Iron & Steel Co., Phoenixville, Pa.
- Pilgrim Drawn Steel Div., Plymouth, Mich.
- PA Pittsburgh Coke & Chemical Co., Pittsburgh
- PS Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh
- Portsmouth Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit
- P13 Phoenix Mig. Co., Joliet, III.
- P14 Pacific Tube Co.
- RI Reeves Steel & Mfg. Co., Dover, O.
- R2 Reliance Div., Eaton Mig. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Roebling Sons Co., John A., Trenton, N. J. R5 Rotary Electric Steel Co., Detroit
- R6 Rodney Metals, Inc., New Bedford, Mass.
- R7 Rome Strip Steel Co., Rome, N. Y.
- S1 Sharon Steel Corp., Sharon, Pa.
- 52 Sheffield Steel Div., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw and Steel Co., Fitchburg, Mass.
- Sweet's Steel Co., Williamsport, Pa.
- 56 Standard Forging Corp., Chicago
- Stanley Works, New Britain, Conn
- Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Corp., Carnegie, Pa. S10 Seneca Steel Service, Buffalo
- TI Tonawanda Iron Div., N. Tonawanda, N. Y.
- 72 Tennessee Coal & Iron Div., Fairfield
- 73 Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
- 77 Texas Steel Co., Fort Worth
- 78 Thompson Wire Co., Boston
- UI United States Steel Corp., Pittsburgh
- U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U.S. Pipe & Foundry Co., Birmingham
- W1 Wallingford Steel Co., Wallingford, Conn. W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- Wa Wheatland Tube Co., Wheatland, Pa
- 16'5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo W7 Wilson Steel & Wire Co., Chicago
- WE Wisconsin Steel Div., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh W12 Wallace Barnes Steel Div., Bristol, Conn.
- YI Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

							BUTT	WELD										SEAN	ILESS			
	1/2	ln.	3/4	In.	1	in.	11/4	In.	11/2	In.	2	In.	21/2-	3 In.	2	In.	21	/2 In.	3	In.	31/2	-4 In.
STANDARD T. & C.	BE.	Gal.	Blk.	Gal.	IIIk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. B3. Youngstown R3	7.25	+8.00	10.25		13.75		16.25 18.25				17.25			2.50								
Fontana K! Pittsburgh J3 Alton, Ill. L!	+3.75 9.25 7.25	+23.00 +6.00 +8.00	0.75 12.25 10.25	$+19.00 \\ +2.00$	2.75 15.75 13.75	+14 ¹ / ₂ 2.50 0.50	5.25 18.25 16.25	+123/4 3.25 1.25	5.75 18.75 16.75	+113/4 4.25 2.25	6.25 19.25 17.25	+11.25 4.75 2.75	7.75 20.75 18.75	+10.50 5.25 2.50		+20.25				+13.00	5.25	+11.50
Sharon M3 Fairless N2 Pittsburgh N1	9.25 7.25 9.25	$+10.00 \\ +8.00 \\ +6.00$	12.25 10.25 12.25	+2.00 +4.00 +2.00	15.75 13.75 15.75	0.50 2.50	18.25 16.25 18.25	0.25 1.25 3.25	16.75 18.75	1.25 2.25 4.25	19.25 17.25 19.25	1.75 2.75 4.75	20.75	2.50 2.50 5.25	5.25	+20.25	1.25	+16.50			5.25	+11.50
Wheeling W5 Wheatland W4 Youngstown Y1	9.25 9.25 9.25		12.25 12.25 12.25	+2.00	15.75 15.75 15.75	2.50 2.50 2.50	18.25	3.25	18.75 18.75	4.25	19.25 19.25 19.25	4.75 4.75 4.75	20.75 20.75	5.25 5.25 5.25	5.25	+20.25			3.75	+13.00		
Indiana Harbor YI. Lorain N2	8.25 9.25	+9.00 +6.00	13.25 12.25		14.75 15.75	1.50 2.50	17.25 18.25	2.25 3.25			18.25	3.75 4.75		4.25 5.25		+20.25		+16.50				
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. B3	11.75				18.75				19.75					5.50								xenite
Youngstown R3 Fairless N2	13.75	+4.00			E0.75	4.50 6.50	21.25	4.25 5.25		5.25	22.25	5.75 6.75		5,50		******						1.100734
Fontana KI	0.75	+2.00	4.75	2.00	7.75	9.30	8.25	5.25	8.75	0.23	9.25		9.75	5.30		******		******	F84 8 4	******	12400	
Pittaburgh /3	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25		8.25	22.25	8.75		7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Alton, Ill. L.I	11.75	+2.00	15.75		18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon M3	13.75	+4.00	17.75	list	20.75	4.50					22.25	5.75		5.50			- 2-4-					1772743
Pittsburgh N/	13.75	+2.00	17.75	4.00	20.75	8.50		7.25			22.25	8.75 8.75	22.75	7.50		+17.75						4
Wheeling W5	13.75	+2.00	17.75	4.00	20.75	8.50		7.25	21.75	8.25	22.25	8.75		7 50	****			******				
Toungstown Y/	13.75	12.00	17.75	4.00	20.75	8.50		7.25	21.75	8.25	22.25	8.75		7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50		+5.50
Indiana Harbor Y1.	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50		- AALVAL		111144				
Lorain N2	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in. 1½ pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b.	m4??					
M.	Cr	V	Mo	Co	per lb	SAE
18	4	1		-	81.68	T-1
18	4	1		5	2.385	7-4
18	4	2	*	-	1.185	T-2
1.5	4	1.5	-8	-	1.04	M-1
6	4	3	6		1.43	M-3
6	4	2	5	-	1.185	M-2
High	-carbo	on chi	romiu	m.,		-3, D-5
Speci	al car	ned m	anga	nese	.45	O-2 W-1
Extra	carl	on			.345	W-1
Regu	lar ca	rbon	100		.29	W-1
Wa	irehoi	ise pi	ices :	on an	id east o	f Mis-
Miss)	ssipp	re 4¢	per	Ib hi	gher. W	est of

CLAD	STEEL	Rase	prices.	cents	ner Ib	6.4
CLAD	SIEEF	Dase	proces.	conts	per 10	1.0.0

		Plate	?. L4)	Sheet (12)	
	Cladding	10 pct	15 pct	20 pct	20 pct
	362		.,,,,,,		35.50
1	304	34.60	38.00	41.50	37.75
den lyn	316	39.70	43.20	46.65	55.50
i	321	36.35	39.80	43.56	44.75
8	347	39.50	43.95	48.45	\$4.25
	405	29.20	33.15	37.05	
	410, 430	28.70	32.65	36.55	

CR Strip (S9) Copper, 10 pct, 2 sides, \$9.85; 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Hot-Rolled (Coiled or Cu			
F.o.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed		
Field Armature	9.00	9.20	10.85		
Elect	11.00	11.025	11.525		
Meter	12.05	12.075	12.575		
Dynamo	13.05	13.05	13.55		
Trans. 72		14.05	14.55		
Trans. 65	14.60	Grain (Oriented		
Trans. 58	15.10	Trans. 80	18.50		
Trans. 52	16.15		19.00		

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (F3); Manafold (E3); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (UI); Warren, O. (R3) $(20 \pm$ higher, HR); Zaneaville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.
Gross Ton
Openhearth lump \$12.70
Old range, bessemer
Old range, nonbessemer 11.70
Mesabi, bessemer 11.60
Mesabi, nonbessemer 11.45
High phosphorus 11.45

MERCHANT WIRE PRODUCTS

	Standard Q Ceated Nails	Weven Wire Fence	"T" Fance Peats	Bad Ties	Galv. Barbed and Twisted Barbines Wice	Morek. Wire Ana'ld	Merch. Wire Galv.
F.a.b. Mill	Cel	Col	Cel	Cel	Cel	¢/lb	é/lb.
					.00		0.50
Alabama City R3	167	181		195		8.10	8.50
Aliquippa, Pa. 13***.	164	179				7.95	8.475
Atlanta A8**	166	182		192		8.05	8.65
Bartonville K2**	100	182		192	130	8.10	8.50
Buffalo #6	104	100	167	100	100	7.95	8.55
Chicago, Ill. N4 **	164	180	167	190	100	8.20	8.75
Cleveland 46	113					8.20	
Cleveland A5 Crawfordsville M4**	166	182		192	100	8.05	8.65
Donora, Pa. A5	164	176		190		8.20	8.75
Duluth 45	164		167	190		8.20	8.75
Fairfield, Ala. 72	164	176	100	190		8.20	8.75
Galvesten D4	169 :	110		130	104	0.40	0.10
Houston S2	169	181		195	189	8.20	8.60
Johnstown, Pa. 8300.	164		167			7.95	8.55
Joliet, Ill. A5	164	176		190		8.20	8.75
Kekeme, Ind. C9"	166	178		192		8.05	8.45
Les Angeles B2**						8.90	9.50
Kansas City S2°	169	181		195	189	8.20	8.60
Minnegue C6†	169	181	172	195	189	8.20	8.60
Menessen P6	167	185			191	8.10	8.10
Pittsburg, Cal. C7	183	199		214	204	9.15	9.70
Rankin, Pa. A5	164	176				8.20	8.75
So. Chicago R3	167	181		195	187	8.10	8.50
S. San Francisco Co	1000			214		8.90	9.30
Sparrows Pt. B3** Struthers, O. Y1*	166			192	190	8.05	8.65
Struthers, O. Y/*						7.95	8.45
Worcester A5	170					8.50	9.05
Williamsport, Pa. S5.	110	4811	175				

• Zinc less than .10¢. † Plus zinc extras. •• 13.5 zinc. † Wholesalers only. ••• .10¢ zinc.

C-R SPRING STEEL

		CARB	ON CO	NTEN	Г
Cents Per Lb F.o.b. Mill		0.41- 0.60	0.61-	0.81- 1.05	1.06-
Baltimore, Md. 78		10.40		15.60	
Bristol, Conn. W12		10.40		15.60	18.55
Boston 78		10.40		15.60	18.55
Buffalo, N. Y. R7		9.80		15.00	17.95
Carnegie, Pa. S9		10.10		15.30	
Cleveland A5		10.10		15.30	18.25
Detroit D1		10.20		15.40	
Detroit D2		10.20		*****	*****
Dover, O. G4		10.10		15.30	18.25
Franklin Park, III. T8	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. C//			12.30	15.30	18.25
Indianapolis C5		9.95		15.60	17.95
Los Angeles	10.85	12.30			
New Castle, Pa. B4		9.80		15.00	
New Haven, Conn. D		10.40		15.60	
Pawtucket, R. I. N7.	9.20	10.40		15.60	18.55
Pittsburgh S7	8.65		12.30	15.30	18.25
Riverdale, Ill. Al			12.30	15.30	18.25
Sharon, Pa. S1	8.65		12.30	15.30	18.25
Trenton R4	11.05	10.40	12.60	15.60	18.55
Wallingford W1	9.10	10.40	12.60	15.60	18.45
Warren, Ohio T4	8.65	10.10	12.30	15.30	18.25
Worcester, Mass, A5	9.20	10.40	12.60	15.60	18.55
Youngstown C5		9.80	12.60	15.00	17.95

BOILER TUBES

\$ per 100 ft. carload	Si	ze	Sear	nless	Elec.	Weld
lots, cut 10 to 24 ft. F.o.b. Mill	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babrock & Wilcox	2	13	36.34	42.56	33.21	
	2½ 3	12	48.94	57.31	44.73	
	3	12		66.18		
	31/2	11		77.25		
	4	10	87.61	102.59	80.07	
National Gube	2	13	36.34	42.56	33.21	
	23/2	12	48.94	57.31	44.73	
	3	12		66.18		
	31/2	11		77.25		
	4	10	87.61	102.59	80.07	
Pittsburgh Steel	2	13	36.34	42.56		
r manual gir Dieser	2 21/2 3	12		57.31		
	3	12	56.51	66.18		
	31/2	11	65.97	77.25		
	4	10	87.61	102.59		

WARE-						1	_		Metro	politan P	rice, dol	lars per l	00 ІЬ.
HOUSES		Sheets		Strip	Plates	Shapes		Bars			Alloy	Bars	
Gises City Delivery! Charge	Het-Relled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Het-Relled		Standard	Hot-Rolled (merchant)	Hot-Relied (special quality)	Cold- Finished	Hat-Rolled 4615 As relied	Hat-Relied 4149 Annealed	Cold-Drawn 4615 As rolled	Cold-Draws 4140
Arlanta	8.17	9.37	9.83	8.21	8.55	8.59	8.45		10.23				
Baltimore \$. 10	7.79-	8.99-	9.12	8.27-	8.12- 8.36	8.57- 8.85	8.34- 8.53		9.69-	14.99	14.44	18.39	18.09
Birmingham 15	7.58-7.80	8.88-	9.52	7.78-			8.07	8.44	10.04-				
Beston 10	9.22	9.83-	11.16	8.89-	9.28	9.20	9.17	9.57		15.79	14.79	19.14	18.39
Buffalo	8.00	9.15	10.90	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.50- 14.65	19.01	18.10 18.25
Chicago 15	7.80	9.00	9.85	7.82-7.97	8.16-	8.20- 8.35	8.07-	8.44-	8.50	15.30	14.10	18.65	17.75
Cincinnati 15	8.89	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.38	18.96	18.03
Cleveland15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	17.83
Denver	9.55	11.09	12.41	9.70	9.80	9.60	9.75		10.54				19.79
Detroit 15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston	8.80	9.75		8.85	8.80	9.10	9.15		10.65	15.50		19.30	19.05
Kansas City ,20	8.52	9.72	10.07	8.60	8.83	8.87	8.73		9.42	15.32	14.77	18.72	18.42
Los Angeles , 10	9.00-	10.75-	11.75	9.20-	9.75	9.25	9.30	9.30	11.80	16. 45	15.45	20.30	19.55
Memphie15	8.02	9.22		8.12	8.35	8.39	8.25		9.85				
Milwankee15	8.08	9.28	9.97	8.10	9.75	9.25	8.35	8.71	8.72	15.43	14.22	18.78	17.87
New York 10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	->+++	15.02	14.69	18.42	18.29
Nerfolk	8.00			8.40	8.35	8.70	8.45		10.70				
Philadelphia 10	8.25	9.17	10.22-	8.68-		8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh 15	7.93	9.14	10.20	7.88-	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	17.90
Portland	8.90	9.65	11.40	10.25 11.05	1	9.35	9.45		13.55	16.70	16.10	20.40	20.25
San Francisco 10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.55	16.45	15.45	20.30	19.55
Seattle	9.35	10.70	11.65	9.50	9.30	9.15-	9.30	9.85	13.15- 13.30	16.55	15.55- 15.65	19.50	19.20
Spokane15	9.50-	10.60-	11.80	9.70	9.20-	9.30-	9.65	10.00	13.30		16.55		20.10
St. Louis 15	8.54	1	10.21	8.34	8.67	8.82	8.58	8.96	9.08-	15.66	14.43-	19.01	18.08
St. Paul15	8.29	9.64	10.31	8.39-	9.05	9.09	8.52		9.21		14.62		18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity. † 16 gage. †† 13½¢ zinc. ‡ Deduct for country delivery.

- The same with the same

RAILS, TRACK SUPPLIES

F.e.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bara	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer UI	5.275	6.25	6.60				
So. Chicago R3				0 995			
Engley 72	5.275	6.25		9.223			
Fairfield T2		6.25		9.225		6.275	
Gary UI	5.275						
Huntington C/6		6.25					
Ind. Harbor 13	5.275		6.60	9.225		6.275	
Ind. Harbor Y/				8.775			
Johnstown B3		6.25					
Joliet UI			6.60				
Kansas City 52				9.225			13 85
Lackawanna B3	5.275	6.25	6.60			6.275	
Lebanon B3 Minnequa C6							13.85
Minnequa C6	5.275	6.75	6.60	9.225		6.275	13.85
Pittsburgh P5				8.775	12.85		
Pittaburgh J3 Seattle B2				9.225			
Seattle B2				9.725		6.425	13.16
Steelton B3	15.275		6.60			6.275	13.85
Struthers YI				8.775			14.00
Torrance C7						6.425	
Williamsport S5		6.15					
Youngstown R3		1		9.225	Laver	1 - 11	

COKE

Furnace, beehive (f.o.b. oven) Net-Ton Connellsville, Pa \$15.00 to \$15.75
Foundry, beehive (f.o.b. oven)
\$17.50 to \$19.00
Foundry oven coke
Buffalo, del'd\$31.75
Detroit, f.o.b
New England, del'd 31.55
Kearney, N. J., f.o.b, 29.75
Philadelphia, f.o.b 29.50
Swedeland, Pa., f.o.b 29.50
Painesville, Ohio, f.o.b 30.50
Erie, Pa., f.o.b 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b
St. Louis, f.o.b
Birmingham, f.o.b 28.85
Milwaukee, f.o.b 30.50
Neville, Is., Pa

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*			
Diam. (In.)	Length (In.)	Price	Diam. (ln.)	Length (In.)	Price	
24	84	24.75	40	100, 110	10.70	
29	72	24.00	35	110	10.70	
16 to 18	72	24.50	30	110	10.85	
1.4	72	25.00	24	72 to 84	11.25	
12	72	25.50	20	90	11.00	
10	60	26.50	17	72	11.40	
10	48	27.00	14	72	11.85	
7	60	26.75	12	60	12.95	
6	60	30.00	10	60	13.06	
4	40 46	33.25		60	13.30	
3	46	35.25				
21/2	30	37.25				
2	24	57.75		1		

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes						
(Cents	per	lb.	frt	allowed	in	quantity)

(Cents per lb, frt allowed in quant	ity)
Copper	
Cast elliptical, 18 in. or longer,	
5000 lb lots	53,42
Electrodeposited	43.28
Brass, 80-20, ball anodes, 2000 lb	
or more	54.00
Zinc, ball anodes, 2000 lb lots	21,25
	m.1. mail
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon,	
5000 lb \$1	.0225
(rolled depolarized add 3¢ per ll	
Cadmium	\$1.70
Tin, ball anodes and elliptical \$1.07 p	er in.
Chemicals	
(Cents per lb, f.o.b. shipping poin	0.3
	77.50
Copper sulphate, 100 lb bags, per	
cwt.	26.65
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed,	
300 lb	45.50
Sodium cyanide, domestic, f.o.b.	
N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	mo,00
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum	00.00
N. Y.	48.00
Charmin puld finite tune 1 to 90	10.00
Chromic acid, flake type, 1 to 20	
100-499 lb drums	31.75

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pet Discounts

Machine and Carriage Bolts	Full Con- tainer Price	30 Con- tainers	20,000 Lb.	40,000 Lb.
1/2" and smaller x 6"	521/2	561/2	5%1/2	591/2
than 6" x longer	4314	471/2	50	513/2
Rolled thread carriage bolts 1/2 in. & smaller \$ 6 in. and shorter	521/2	561/2	581/2	591/2
Lag, all diam. x 6" & shorter	$52^{1/2}$	56	55	59
Lag, all diam. longer than 6 in.	441/2	48	50	51
Plow bolts, 1/2" and smaller x 6" and shorter	52	551/2	57	58

(Add 25 net for broken case quantities)

Cana 25 per for broken case qua	ntities)
% in. to 1 % in. inclusive	I Case of g Price 61½ 57½ 62½ 56
C. P. Hex reg. & hvy. \$\frac{a_1}{3}\$ in. and smaller \$\frac{7}{8}\$ in. to \$1\frac{1}{9}\$ in. inclusive \$1\frac{9}{9}\$ in. and larger	61 ½ 57 ½ 56
Hot Galv. Nuts (All Types)	48
Semi-finished Hex Nuts % in. or smaller 7s, in. to 1½ in. inclusive 1% in. and larger (Add 25 pet for broken case quantities)	56

Finished
1 in. and smaller 64

Rivets

	Base per 100 lb
16 in, and larger .	
	Pct Off List
7/16 in, and smaller	23

Discount (Packages)

Cap Screws

Bright T	reated	H,C,H
New std, hex head, pack- aged		
5," diam, and smaller x		
6" and shorter	4.4	31
6" and shorter	27	9
longer than 6"	14	+ 6
& longer than 6"	1,6	+24
		[8 Steel
		inished

Full-Finished Cartons Bulk and shorter 44 61 54" through 1" dia. x 6" 44 61 54" through 1" dia. x 6" 27 49 Minimum quantity—14" through 55" diam., 15,000 pieces: 1/16" through 55" diam., 5,000 pieces: 34" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

		Disc	ount
Plain Finish Cartons Bulk	Quantity	Mach. Screws	Stove Bolts
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to 1/2" diam. incl.	15,000-100,000	9	84
All diam. over 3" long	5,000-100,000) —	54

Machine Screw & Stove Bolt Nuts

		Discount			
In cartons	Quantity	Hex 16	Square 19		
In Bulk)				
diam. & smaller	{ 15,000-100,000	7	9		

CAST IRON WATER PIPE INDEX

Birming	han	n											0	0	0		9					1	19	.0
New Yo	rk											×	*						. ,			1	31	.7
Chicago																						1	34	.1
San Fra	nel	SC	0.	I	4.		A															1	41	.5
Dec.	195	5	1	120	al	24	e		(9	lo	u	18	1	1	В		0	7		he	ea	vi	er
6 in. or	lar	·a	29		1	16	2	ì	a	99	d		8	10	4	a	01	t	p	12	36		E	x-
planatio	278 .	n		,	5	7		1	30	29	ot			1	1.		1	9	5	5		18	84	€.
Source:	#7.	8.		p	11	96	2	a	11.	d		F	0	14	91	d	9	3/	1	Ci	3.			

REFRACTORIES

Fire Clay Brick

(e	xcept S	alina,	Pa.,	Md.,	Mo., (\$5.00)	per 1000 hio, Pa. \$128.00
Sec.	1 Ohio quality, 2 Ohio	Pa., 1	Md., I	Cy., 3	Io., Ill.	98.00
Grot (e	and fire	alina.	Pa.,	add	\$2.00)	20.00

Silica Brick

Jilled Dirok	
Mt. Union, Pa., Ensiey, Ala\$	140.00
Childs, Hays, Pa	145.00
Chicago District	150.00
Western Utah 144.00-1	165 00
Western Utan 141.00	70.00
California	110.00
Super Duty	
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O., Morrisville	
150.00-	157 00
	26.50
Silica cement, net ton, bulk, Latrobe	20.00
Silica cement, net ton, bulk, Chi-	
cago	24.00
Silica cement, net ton, bulk, Ens-	
lev. Ala.	25.50
Silica cement, net ton, bulk, Mt.	
Union	23.00
Silica cement, net ton, bulk, Utah	
and Calif	35.00

Chrome Bric	k	Per net ton
Standard cher	mically bonded,	Balt. \$98.00
	mically bonded,	
Burned, Balt.		92.00

Magnesite Brick

Standard, Baltimo	ore				 	. 1	\$1	21	.0	10
Chemically bonde		altin	noi	67			1	09	0.0	10

Grain	Ma	gı	16	25	i	h	6			40	S	t.		3	á	1	to	,	3,	6	-	ix	1.	grains
Domes	tic,	2.	0	.t	١.	1	C	B.	11	ti	n	8	01	Pi B.	h	1	n	V	b	a	8	k		\$69.40
Luni in bu																								43.00
in sa	icks			0				9	0		0	0	0	0	×				×	*	×	*	4	49.00

Dead	Burn	ed	Dole	o m	ii	le	,						P	61	,	net ton
F.o.b.	bulk W.	Va.	oduo.	io	g	1	90) t	n i	.8		ir	1:			\$16.00
Mid	west					٠	0				0	0				16.35

METAL POWDERS

MEINELOUIS	
Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh	
Swedish sponge iron f.o.b. Riverton, N. J., ocean bags 8.50¢	
Canadian sponge iron, Del'd in East, carloads 9.5¢	
Domestic sponge iron, 98+% Fe, carload lots	
Electrolytic iron, annealed, imported 99.5+% Fe 27.56	
domestic 99.5+% Fe 36.5¢ Electrolytic iron, unannealed	
minus 325 mesh, 99+% Fe 57.0¢	
Electrolytic iron melting stock, 99.84% pure 22.0c	
Carbonyl iron size 5 to 10 micron, 98%, 99.8 + % Fe. 86.0¢ to \$1.55	
Aluminum, freight allowed 38.00¢ Brass, 10 ton lots37.50¢ to 50.00¢	
Copper, electrolytic	
Cadmium, 100-199 lb, 95¢ plus metal value Chromium, electrolytic, 99.85%	
min. Fe .03 max. Del'd \$5.00	
Lead 8.90¢ plus metal value Manganese f.o.b. Exton, Pa. 46.0¢	١
Molybdenum, 99%\$3.60 to \$3.95 Nickel, unannealed \$1.00	
Nickel, annealed	
#80 \$1.13	
Solder powder 7.0¢ to 9.0¢ plus met, value	
Stainless steel, 302	
Tin 14.00¢ plus metal value Tungsten, 99% (65 mesh) \$4.20	1
Zinc, 10 ton lots 18.75¢ to 32.50¢	i



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NEW YORK

Sales Offices in Principal Cities

FERROALLOY PRICES

(Effective March 12, 1957)		
Ferrochrome Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. St. 0.02% C 38.50	Spiegeleisen Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa. Manganese Silicon	Alsifer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb. Carloads
0.02% C . 41.50 0.20% C . 38.50 0.03% C . 41.50 0.50% C . 38.25 0.10% C . 38.50 1.00% C . 37.50 0.10% C . 39.50 1.50% C . 37.35 0.15% C . 37.35 2.00% C . 37.25 4.00-4.50% C, \$7.70% Cr, 1-2% SI 27.75 3.50-5.00% C, \$7.764% Cr, 2.00-4.50%	16 to 19% 3% max. \$100.50 19 to 21% 3% max. 102.50 21 to 23% 3% max. 105.00	Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo
4.00-4.50% C, 67.70% Cr, 1-2% S1 27.75 8.50-5.00% C, 57-64% Cr, 2.00-4.50% S1 27.75	Manganese Metal Contract basis, 2 in. x down, cents per pound of metal, delivered. 95.50% min. Mn, 0.2% max. C, 1% max.	Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb. Ton lots
0.025% C (Simplex) 34.75 0.10% C, 50-52% Cr, 2% max Si 35.75 8.50% max C, 60-55% Cr, 3-6% Sl. 24.00 8.50% C, 50-55% Cr, 3% max Sl. 24.00	95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe. Carload, packed	Less ton lots. 6.95 Ferro-tantalum-columbium, 20 % Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x
High Nitrogen Ferrochrome Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.	Electrolytic Manganese F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O.,	D per lb con't Sb plus Ta \$4.95 Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo \$1.68
Chromium Metal	delivered, cents per pound. 33.00 Carloads 35.00 Ton lots 35.00 250 to 1999 lb 37.00 Premium for Hydrogen-removed	Ferrophosphorus, electric, 23- 26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage,
Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr. 1% max. Fe. 0.10% max. C	Premium for Hydrogen-removed metal 0.75 Medium Carbon Ferromanganese	per gross ton
9 to 11% C, 33-91% Cr, 0.75% Fe 1.40 Electrolytic Chromium Metal Contract prices per lb of metal 2" x D	Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 25.50	per lb. contained Ti \$1.35 Ferrotitanium, 25% low carbon.
plate (%" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max. Carloads \$1.29 Ton lots 1.31 Less ton lots 1.31	Low-Carb Ferromanganese Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	0.10% C max., f.o.b. Niagara Falls. N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti
Less ton lots	Carloads Ton Less 0.07% max. C, 0.06% 37.15 39.95 41.15 0.07% max. C 35.10 37.90 39.10 0.10% max. C 34.35 37.15 38.35	Less ton lots
S-in. x down, per ib of Cr, packed. Carloads 44.65 Ton lots 48.95 Less ton lots 51.45	0.15% max. C 33.60 36.40 37.40 0.30% max. C 32.10 34.90 36.10 0.50% max. C 31.60 34.40 35.60 0.75% max. C, 80.85%	load per net ton
Colcium-Silicon Contract price per lb of alloy, lump,	Silicomanganese	Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa
delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe. Carloads	Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Sl, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point. Carloads bulk	Langeloth, Pa. \$1.33 Simanal, 20% Sl, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohlo, freight allowed, per lb.
Calcium-Manganese—Silicon Contract prices, cents per lb of alloy, lump, delivered, packed. 16-20% Ca. 14-18% Mp. 53-59% Si	Ton lots	Carload, bulk lump
16-20% Ca, 14-18% Mn, 53-59% Sl. Carloads 24.25 Ton lots 26.15 Less ton lots 27.15	Silvery Iron (electric furnace) Sil 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$100.00 gross	tained V_2O_8 \$1.38 Zirconium contract basis, per lb of alloy 35-40% f.o.b. freight allowed,
Contract prices, cents per pound of alloy, delivered, 60-65% St, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.	ton, freight allowed to normal trade area. Si 15.01 to 15.50 pet, f.o.b. Niagara Falls, N. Y., \$93.00.	carloads, packed 27.25∉ 12-15%, del'd lump, bulk- carloads 9.25∉
Ton lots	Contract price, cents per pound con- tained Si, lump size, delivered, packed. Ton lots, Carloads,	Boron Agents Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio,
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% St. 8-11% Mn, packed.	96.75% Si, 1.25% Fe 23.70 22.40 98% Si, 0.75% Fe 24.45 23.15	freight allowed, B 3-4%, Si 40- 45%, per lb contained B 2000 lb carload
Carload lots 17.20 Ton lots 18.70 Less ton lots 19.95	Silicon Briquets Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si,	Ton lots per pound 45¢ Less ton lots, per pound 50¢ Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%
Graphidox No. 4 Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. St 48 to 52%, Tl 9 to 11%,	briquets. Carloads, bulk 7.70 Ton lots, packed 10.50	f.o.b., Suspension Bridge, N. Y., freight allowed. Ton lots per pound 14.00¢ Ferroborom, 17.50 min. B, 1.50%
Ca 5 to 7%. Carload packed	Electric Ferrosilicon Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots 1.20 F.o.b. Wash., Pa., Niagara Falls, N. Y. delivered 100 lb up
Ferromanganese Maximum contract base price, f.o.b., lump size, base content 74 to 76 pet Mn.	50% Si 13.90 75% Si 16.80 65% Si 15.65 85% Si 18.50 90% Si 19.90	10 to 14% B
Producing Point Cents Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. 12.75	Ferrovandium 50-55% V contract, basis, delivered, per pound, contained V, carloads, packed. Openhearth 3.20 Crucible 3.30	freight, allowed, 100 lb and over No. 1 \$1.05 No. 79 \$50\$ Manganese - Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50%
Sheridan, Pa. 12.75 Philo, Ohlo 12.75 S. Duquesne 12.75	High speed steel (Primos) 3.40 Calcium Metal Eastern mone contract prices, cents per	max. Sl, 3.00% max. C, 2 in. x D, del'd. Ton lots
Add or subtract 0.1¢ for each 1 pct Mn above or below base content. Briquets, delivered, 66 pct Mn: Carloads, bulk	pound of metal, delivered. Cast Turnings Distilled Ton lots \$2.05 \$2.95 \$3.75 Less ton lots 2.40 \$3.30 4.55	Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots
		7

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THE CLEARING HOUSE

Philadelphia Looking For Bargains

Many used machinery buyers are playing a waiting game, and shopping around.

High prices also discourage dealers who want equipment for salesroom stocks.

• "Good equipment is difficult to find, easy to sell. But customers just aren't interested in any used machinery that isn't first class."

"Buyers are looking for bargains these days."

"Business is good, but it could be better."

That's the way three used machine dealers in the Delaware Valley sum up current business. And their opinion is shared by most other local dealers.

There are a few who find the market good. One described January business as his all-time best. However, most used equipment suppliers find the market somewhat "soft."

Sitting It Out—Customers seem to be getting fussier. They're shopping around more and taking more time to make up their minds. One dealer described a customer who stood and looked at a machine tool he was interested in for three hours and then didn't buy.

Certainly the market has winter doldrums. And the tight money situation isn't helping. But mostly it seems to be a case where the music is playing, but the buyers don't want to dance.

One puzzling aspect of the market in this area is the flow of equipment west. One dealer had a request from Indiana for a jig borer. The buyer came in, took a look at the machine, and bought it. A few weeks later there came another call, this time from Illinois, for a similar tool. Another sale resulted.

Price Tells—This type of activity is noted by other dealers, too. They can't explain exactly why it's happening. Granted other areas are in need of equipment but the Philadelphia market is a thriving metalworking center. It seems to be a case of equipment going where regard for price is less of a factor.

The local buyers are very priceconscious and want inducements to buy. The sellers want high prices for their equipment. And the dealers themselves aren't buying too heavily for inventory.

"The best inventory these days is cash," is the way one dealer puts it

Locating equipment to sell continues to be a problem.

Bills Need Some Help

Start writing letters to your Congressmen! That's the word to buyers and sellers interested in bills allowing accelerated depreciation on used machinery and equipment.

Until now there's been no action taken on any of the current bills proposing this, according to THE IRON AGE Washington sources. Several measures, including one from Sen. Sparkman, were introduced in Congress in January, but nothing has happened since. In addition to the Senate bill (S.351), similar bills are pending in the House of Representatives. Among sponsors of these measures in the House are Rep. Bennett, D-Fla.; Rep. Fulton, R-Pa.; and Rep. Hale, R-Me.

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5 ton R&M
40' Span 220/3/60 A.C.

25 ton Cleveland To" Span 230/3/60 A.C.

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With 10 ton Auxiliary
10,000 # Aetna Standard. Length of Draw 44'. Used
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10 5 Acme. Alax National
10 5 Acme. Alax National
11 10 5 Acme. Alax Clutch. NEW 1954
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FORGING—800 lb. to 20,000 lb.
LEVELER—STRETCHER
100 ton Hydr. Stretcher Leveler. Capy. .032" Ga.
36" Width, 96" Length; 4 Sheets in a Pack
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37" Torrington, 19 Rolls 1-31/32" Dia. Backed up
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Whise, G.E.

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the W, 60" Throat
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Will accommodate 36" wide sheet 16 ga. or up to
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No. 4 Mesta Bill Lik, Capacity 2" x 1
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No. 12 Buffalo Armor Plate
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6" x 10" Peek Sagar No. 672
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24 Blake & Johnson
36" Wean Slitting Line
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4" x 11/32" Flat & Edge 175" x 3/16"
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SWAGING MACHINE
#6%A Fen. Capacity 2½" Tube 3½" Solid 10"
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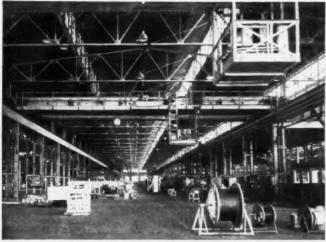
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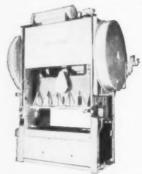
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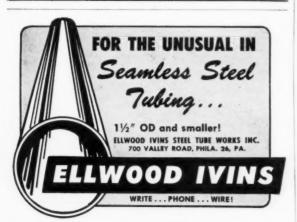
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Openhearths Idled In Chicago Area

A shortage of oxygen due to the Linde Air Products Co. strike, and the easing steel market, caused steel companies in the Chicago area to withdraw 12 to 15 openhearth furnaces from production. Higher cost of non-oxygen operation of the furnaces is regarded as pointless unless order books for finished steel begin to fill at a more rapid rate. Youngstown Sheet & Tube, meanwhile, closed down five furnaces in its Chicago plant due to a "temporary inventory adjustment."

More Coke Ovens For U. S. Pipe

U. S. Pipe & Foundry Co., Birmingham, announces it will build 60 new coke ovens at its Birmingham plant. The cost: more than \$1 million. This will increase the company's coke ovens by one-third.

Missouri Ore Deposit Studied

Development of an iron ore deposit in east-central Missouri is being studied by St. Joseph Lead Co. and Bethlehem Steel Co. The ore body, known locally as the Pea Ridge deposit, is one of three discovered on St. Joseph property through an airborne magnetometer survey in 1951.

Connors Steel Expands

Connors Steel Div., H. K. Porter Co., Huntington, W. Va., is planning a \$2 million expansion that will increase capacity by 50 pct. Included are a new reheating furnace, new mill hot beds, three rolling mill stands, and major improvements to existing equipment. Completion is expected in 18 months.

Missile-Launching Sub Planned

Westinghouse Electric Corp. is designing a nuclear propulsion plant for an atomic-powered submarine capable of carrying and firing guided missiles. It will be the first guided missile sub with nuclear power. The company is also working on the first nuclear power plant for a large surface vessel.

Canadian Ore Pact Enlarged

New agreements between Canadian Javelin, Ltd. and Pickands, Mather & Co., will speed development of the Wabash Lake Iron Ore deposits. New agreements cover the whole of Wabash Lake area, superseding last fall's contracts for the western end of the lake only. Details of the new agreements will be announced shortly.

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

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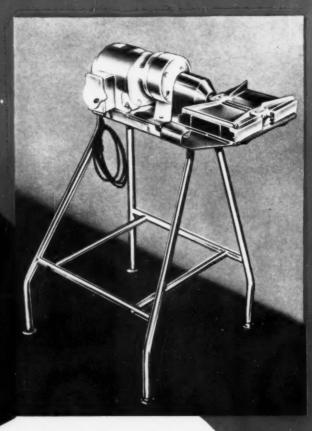
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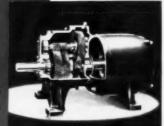
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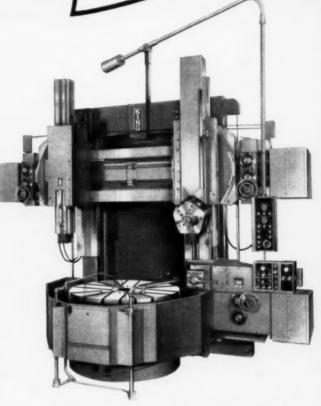
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